

ENVIRONMENTAL PROTECTION AGENCY

18 AUG 1975

Mr. J. Leonard Ledbetter
Director, Environmental Protection Division
Department of Natural Resources
270 Washington Street, S. W.
Atlanta, Georgia 30334

Dear Mr. Ledbetter:

In accordance with Section 303(c)(3) of the Federal Water Pollution Control Act Amendments of 1972, I am approving certain revisions to Georgia's Water Quality Standards, as submitted on August 4, 1975. These revisions change the use classification and associated water quality criteria for the Chattahoochee River, Peachtree Creek to Cedar Creek, from Industrial to Fishing.

We look forward to working with you in implementing this new classification.

Sincerely yours,

/s/ Orin G. Briggs, Acting
Deputy Regional Administrator

Jack E. Raven
Regional Administrator

cc: Gene McNeill
Division Directors
John Christian

CWFerst/rm:8/7/75:5989

File A1.09- (Attach in A.3.00)
GA.

CONCURRENCES							
SYMBOL	Aut	JTM					
SURNAME	Ferst	MARLAR					
DATE	8/7/75	8/7/75					



JOE D. TANNER
Commissioner

Department of Natural Resources

ENVIRONMENTAL PROTECTION DIVISION
270 WASHINGTON STREET, S.W.
ATLANTA, GEORGIA 30334

J. LEONARD LEDBETTER
Division Director

April 5, 1975

STATE OF GEORGIA
COUNTY OF FULTON

ENVIRONMENTAL PROTECTION DIVISION
GEORGIA DEPARTMENT OF NATURAL RESOURCES

NOTICE OF HEARING TO ALL INTERESTED PERSONS AND PARTIES

You are hereby notified that a public hearing will be held at 1:00 p.m. on May 7, 1975, in Room 401 of the State Department of Transportation Building, No. 2 Capitol Square, S. W., Atlanta, Georgia.

The purpose of the hearing will be to present and receive comments on a proposal to change the water use classification of the Chattahoochee River over the reach from Peachtree Creek to Cedar Creek.

The current classification is:

Chattahoochee River	Peachtree Creek to Cedar Creek	Classification: Industrial
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The proposed classification is:

Chattahoochee River	Peachtree Creek to Cedar Creek	Classification: Fishing*
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*Applicable criteria must be met when the river flow at a point immediately upstream from Peachtree Creek equals or exceeds 750 cfs (Atlanta gage flow minus Atlanta water supply withdrawal) unless violations occur due to uncontrolled urban storm water runoff and/or combined sewer overflows.

At the hearing, anyone may present data, make a statement, or offer a viewpoint or argument either orally or in writing. Lengthy statements containing considerable technical or economic data shall be submitted in writing for the official record. Oral statements should be concise to permit everyone an opportunity to be heard. Participants in the hearing are requested to register on arrival and to notify the registering official of their intent to give a statement. Hearing participants will not be subject to questioning from the audience but may be questioned by the hearing officer for clarification of technical points or to develop better understanding of statements.

Statements or briefs may be submitted within seven calendar days following the date of the hearing to Environmental Protection Division, 270 Washington Street, S. W., Room 322, Atlanta, Georgia 30334.



Maurano, Stephen

From: Brad Konwick <Brad.Konwick@dnr.state.ga.us>
Sent: Tuesday, May 13, 2014 3:52 PM
To: Maurano, Stephen
Subject: RE: 750 cfs rule

Thank you

From: Maurano, Stephen [mailto:Maurano.Stephen@epa.gov]
Sent: Tuesday, May 13, 2014 3:47 PM
To: Brad Konwick
Subject: RE: 750 cfs rule

Looking at Roy Burke's 1983 summary of the issue that Liz previously forwarded, GA Water Control Board proposed it in 1966 as part of a use upgrade. Per our records, EPA received it August 4, 1975 and approved it August 18, 1975.

Stephen Maurano
U.S. Environmental Protection Agency, Region 4
Water Division, Planning Branch, Standards Section
61 Forsyth St SW, Atlanta, GA 30303
(404) 562 – 9044 maurano.stephen@epa.gov

From: Brad Konwick [mailto:Brad.Konwick@dnr.state.ga.us]
Sent: Tuesday, May 13, 2014 1:58 PM
To: Maurano, Stephen
Subject: 750 cfs rule

Hi Stephen,

We are trying to locate when exactly we put this footnote in our Rules for the Chattahoochee River at Peachtree Creek. We are having a hard time finding information on this. I was wondering if any of your files at EPA have information on this? Sorry to ask for help on this.

I'm thinking it was in 1976/1977. Liz seems to think around 1983.

Thanks,
Brad

Maurano, Stephen

From: Maurano, Stephen
Sent: Tuesday, May 27, 2014 5:06 PM
To: Booth, Elizabeth
Cc: Cowie, Gail; Brad Konwick
Subject: RE: Peachtree 750
Attachments: Burke1983.PDF; GA Chattahoochee River 750 cfs WQS Approval 08 18 1975.pdf

Hi Liz,

Sure. I think the addition of the 750 footnote, in the context of the use upgrade from industrial to fishing, is relevant (attached is the approval letter). The context is found in the Roy Burke write up (also attached).

Best,

Stephen Maurano
U.S. Environmental Protection Agency, Region 4
Water Division, Planning Branch, Standards Section
61 Forsyth St SW, Atlanta, GA 30303
(404) 562 – 9044 maurano.stephen@epa.gov

From: Booth, Elizabeth [<mailto:Elizabeth.Booth@dnr.state.ga.us>]
Sent: Tuesday, May 27, 2014 11:29 AM
To: Maurano, Stephen
Cc: Cowie, Gail; Brad Konwick
Subject: Peachtree 750

Good morning Stephen, You mentioned to me that EPA has something in their files about the original submittal of the 750 cfs that affects your interpretation of the footnote. Could you please forward a copy of those documents to me so that I can look them over. Thanks Liz

As of February 18th, I will be located in the Sloppy Floyd East Tower. My new contact information is:

Elizabeth A. Booth, Ph.D., P.E.
Program Manager
Watershed Planning and Monitoring Program
Watershed Protection Branch
2 MLK, Jr. Dr. S.W., Suite 1152
Atlanta, GA 30334
404 463-4929
elizabeth.booth@dnr.state.ga.us

EVOLUTION OF THE 750 CFS

September 1983

ROY BURKE "11"

I. INTRODUCTION

On 17 July 1974, at a public meeting on "Lake Sidney Lanier Project Review", the Georgia Environmental Protection Division outlined its policies for the protection of water quality in the Chattahoochee River between Buford Dam and West Point Dam. Included in this broad statement was the announcement that "the flow in the Chattahoochee River at the point between the existing City of Atlanta water intake and Peachtree Creek must not be less than 750 cfs at any time." The technical analyses supporting this number had been performed, and necessary regulations had been officially adopted, during the preceding year. However, 17 July 1974 is often cited as the date on which "the 750 cfs" became official.

Since then, the 750 cfs has become identified as the minimum flow in the Chattahoochee River, below the Atlanta water intake, required for adequate dilution of wastewater discharges from the metropolitan area. Furthermore, because the 750 cfs was adopted by the Environmental Protection Division, that number has been narrowly viewed as reflecting only the concern for wastewater dilution. However, the technical staff of EPD incorporated other important factors to arrive eventually at a figure (750 cfs) which reasonably balanced the major issues being expressed at that time.

For example, a river flow of 750 cfs corresponds to a specific level of required waste treatment which corresponds to specific costs. Assumed river flow less than 750 cfs will cause treatment costs to rise; flows greater will cause costs to drop. If the 750 cfs figure related only to treatment cost minimization for wastewater dilution then higher flows would have been adopted. However, higher

flows (required at Atlanta) mean less water available upstream for multipurpose use at Lake Sidney Lanier and from Buford Dam downstream to Atlanta by way of Morgan Falls Dam. Higher flows required at Atlanta thus increase conflicts with upstream multiple uses already established by contract, and increase the hydrologic uncertainty associated with assuming higher minimum flows. Thus, the 750 cfs reflects a balance between increasing waste treatment costs, increasing water use conflicts, and increasing hydrologic uncertainties, given that water quality standards were also (at that time) being upgraded from the "industrial" to "fishing" classification.

II. BACKGROUND

The analyses and decisions leading up to the announced policy of 750 cfs minimum occurred 10 years ago. After the passage of a decade, the circumstances surrounding and preceding these actions tend to fade from view and lose their impact. Thus, a brief review of the relevant events affecting the 1974 decision will help keep in perspective the major issues of that time.

A. Buford Dam and Lake Sidney Lanier

Buford Dam was constructed by the Corps of Engineers in 1958. Early studies leading to the construction of Buford Dam even then emphasized the need for flow augmentation in the Chattahoochee River to protect water quality against increases in waste discharges. Thus, the Congressional Document (House Document No. 300, 80th Congress, First Session, 1947) required that minimum releases from Buford should be such that a minimum flow at Atlanta of 650 cfs be maintained at all

times. This 650 cfs did not account for any withdrawals by Atlanta or any intake upstream between Lake Lanier and the City of Atlanta. One small turbine at Buford was to be operated at 600 cfs, at all times, assuming that local tributary inflows below the dam would seldom drop lower than 50 cfs. In the early 1950's, this was more than sufficient to meet water demands and provide some additional amount for water quality, which was not of major concern at that time. The average water supply withdrawal by Atlanta in 1950 was 85 cfs. The minimum recorded daily flow in the Chattahoochee River before construction of Buford Dam was 296 cfs at Atlanta in September 1957, so 650 cfs was a considerable increase in minimum flow.

B. Morgan Falls Dam

Morgan Falls Dam, located 36 miles downstream from Buford Dam and 12 miles upstream from Atlanta, began producing electric power in October 1904. Shortly after Buford Dam was constructed in 1958, the City of Atlanta had already recognized that 650 cfs total minimum flow in the river was not adequate after upstream withdrawals. Thus, in 1960, Atlanta funded the expansion of storage capacity at Morgan Falls Dam, jointly with Georgia Power Company, in order to guarantee a minimum release from Morgan Falls of 750 cfs. (This did not include tributary inflows downstream.) The City of Atlanta and Cobb County could withdraw their water supply needs and the remainder would be available for wastewater dilution. (The City of Atlanta, like most major cities in Georgia, did not progress from primary to secondary treatment of wastewater until the early 1970's. The City made a request to Georgia Power to assist in devising some method of reregulating flows released by Buford Dam to assure a sufficient flow for "proper disposition

of sewage.") The agreement between the City of Atlanta and the Georgia Power Company as to the raising of the dam and the subsequent operation of the project is stated in a contract dated September 6, 1957. Georgia Power Company's commitments to the City of Atlanta as defined in that contract call for the release of water according to a specified schedule. According to the schedule, releases from the Morgan Falls Dam shall be such as to provide a minimum flow of at least 750 cfs at all times at Atlanta (above the Atlanta intake) and to provide flows in excess of 750 cfs in the Atlanta area in the daytime.

C. December 1965, Consultant's Report

In December 1965 a local consultant submitted to the City of Atlanta their findings and recommendations for the treatment of the City's wastewater discharged to the Chattahoochee River. The statements below were taken from the Letter of Transmittal accompanying their final report:

"The quality of the water pollution control plant effluents discharged to the Chattahoochee will conform to requirements stipulated by the State of Georgia Water Quality Control Board that an 85 per cent degree of treatment will be necessary to produce relatively stable plant effluents, virtually eliminating harmful bacteria by chlorination and maintaining an ample dissolved oxygen content in the river water as it passes the treatment plants.

"This required degree of treatment can readily be met by the R. M. Clayton Plant dependent solely upon minimum average weekly releases of 1600 cubic feet per second from Buford Dam in accordance with the method of operation provided by the 80th Congress in 1947 when construction of the dam was authorized. As time goes on, however, it will be necessary to obtain increased minimum flow releases from Buford Dam or to provide complete reregulation of the river to obtain this minimum flow coincident with peak effluent discharges from Clayton Plant.

"The same degree of treatment can also be met by the Utoy Creek and Sandy Creek Plants during minimum average weekly flows and present conditions of river temperature until about the year 1985. River temperatures are raised by steam-electric generating plants Atkinson and McDonough below Clayton Plant and again

at the Yates steam-electric generating plant downstream to such an extent that the estimated oxygen content of the river water will be seriously depleted at minimum flow by the year 1985. Remedies may be found either by curtailing steam plant operations during minimum river flow, by increased river flow through changes in regulation, or by discovery and employment of new methods of waste treatment to obtain higher removals of organics....

"Maintenance of the desired river water quality also depends upon the right of the Atlanta metropolitan area to use of the free flowing river for assimilation of its wastes after giving them the highest practical degree of treatment. Downstream impoundments proposed for the Chattahoochee near Atlanta will destroy the self-purification power of the river to such an extent that water quality in the nearest downstream reservoir will not be safe for unlimited recreational or water supply use. Here again the responsibility does not rest with the Atlanta Metropolitan Sewer System, but any remedies adopted should be chargeable to the cost of constructing the impoundments."

D. Deterioration of Chattahoochee River water quality

Georgia's Trend Monitoring Network has been in operation since 1968.

Conclusions drawn from early trend monitoring reports best describe water quality conditions in the Chattahoochee River 10 to 15 years ago:

"Beginning at the R. M. Clayton wastewater treatment plant just below Atlanta's water intake, the Chattahoochee River is characterized by poor water quality for a reach of some seventy miles, of which the first forty miles are considered grossly polluted...inadequately treated wastewaters from the metropolitan area in general, but primarily from the City of Atlanta, are responsible for these problems."

The river was found to be in near septic condition during the hot, dry months of July through October rendering it entirely unsatisfactory for all legitimate uses for at least 40 miles.

Table 1 contains data describing early dissolved oxygen problems at Highway 92. Each dissolved oxygen value reflects a single "grab" sample, that is, the prevailing value when the sample was dipped. These are, therefore, instantaneous values and are not daily averages. At this point, three observations can be made.

First, hot weather induces dissolved oxygen problems. From 1968-1974 dissolved oxygen in January varied around 8 mg/l. During the same period, July, August, September and October averaged around 2.9 mg/l, a 64% reduction. Second, the minimum D.O. standard of 4 mg/l is violated in 64% of the samples grabbed in July through October for the period 1968-1974. And, third, near septic conditions occur frequently with D.O. dropping to 0.0 mg/l in September 1973.

Table 2 contains data describing the effects on dissolved oxygen created by municipal sewage. Each value in the table is an annual average of monthly grab samples for that year. Two features of Table 2 are relevant. First, upstream and downstream D.O. values can be compared side-by-side. And, second, annual minimums can be compared to annual averages. In all cases, D.O. values at Highway 92 are substantially lower than those at the Atlanta Water Intake. This depression in D.O. is a result of municipal sewage discharges. In all cases, the water approaching Atlanta from the North is clean and healthy with respect to D.O. levels averaging above 9.0 mg/l and ranging no lower than 8.0 mg/l. In all cases, from 1968 to 1974, annual minimum D.O. at Highway 92 dropped to septic levels typically below 1 mg/l.

E. October 1972, The Federal Water Pollution Control Act (PL 92-500)

After October 1972, PL 92-500 required that each state conform to a uniform approach to water quality management. This approach included NPDES permits, Federal cost-sharing of municipal treatment plant construction, scientifically determined effluent limits, increased emphasis on the control of nonpoint source pollution (including combined sewer overflows), triennial review of water quality

standards, and comprehensive long-range water quality planning on an areawide basis. As an outgrowth of PL 92-500, Georgia had developed its 1st Edition Basin Plans specifying water pollution control needs to the year 2000, by the time decisions had to be made on the 750 cfs flow value. Thus, the fresh impetus to water quality control, provided by a far-reaching new Federal law, was being felt very strongly in 1973-74.

F. Corps of Engineers, Water Resources Management Study

The Metropolitan Atlanta Water Resources Study was authorized by resolution adopted 2 March 1972 by the Committee on Public Works, US Senate, 92nd Congress, 2nd Session. According to this resolution, the study was supposed to provide "a plan for the development, utilization, and conservation of water and related land resources for Atlanta, Georgia, and contiguous areas." Central to the completion of this study was the determination of minimum flow requirements for waste dilution in the Atlanta metropolitan area. Thus, in 1973 and 1974 great pressure was being exerted by several water-related agencies, involved in this study, for "a number" so the study could proceed unimpeded to its formal conclusion.

G. Water quality standards

In a letter dated 18 August 1975, the Administrator of EPA Region IV approved the revision of the use classification for the Chattahoochee River, from Peachtree Creek to Cedar Creek, from "industrial" to "fishing". This revised the minimum water quality standard for dissolved oxygen from 3 mg/l to 5 mg/l, expressed as a daily average. However, even though the standards revision was not approved until

August 1975, the anticipation of "upgrading" for the Chattahoochee River was felt two years earlier. Thus, the expected requirement to meet more stringent water quality standards was an essential ingredient in deliberations leading up to adoption of the 750 cfs.

H. Water use projections

Public works for water supply and wastewater disposal are always based on future projections of demand and need. Prior to 1974, these projections could be found in documents like the 1965 Consultant's Report. However, the COE Metropolitan Atlanta Area Water Resources Management Study and the studies incorporated into the Division's 1st Edition Basin Plans revealed that existing projections of water supply demands and wastewater generation were substantially underestimated. More water was expected to be withdrawn for water supply, and more wastewater was expected to be generated by the year 2000 than earlier studies had shown. For instance, in 1974 data showed that, at low-flow conditions, 6.4 cfs of river flow was available to dilute each cfs of waste flow. By the year 2000, at low flow conditions, there would be only 1 cfs of river flow available for each cfs of waste flow.

III. DEVELOPMENT OF THE 750 CFS

Thus in 1974, when an official "number" was needed, there were a variety of prior conditions and pressing issues incorporated into the analysis.

- The 1947 Congressional Documents had already required a minimum of 650 cfs at the Atlanta water intake.
- The City of Atlanta had contracted with Georgia Power, in September 1957, to share the cost of raising the pool elevations behind Morgan

Falls Dam to guarantee a minimum of 750 cfs from Morgan Falls, at all times.

- As early as 1965, consulting engineers (1) identified the need to increase minimum flow releases from Buford Dam to dilute anticipated waste discharges, (2) projected that the oxygen content of the Chattahoochee would be seriously depleted at low flow by 1985, and (3) concluded that downstream reservoirs would destroy the self-purification power of the river.
- By 1968, water quality in the Chattahoochee River around Atlanta had deteriorated, because of municipal sewage discharges, to the extent that dissolved oxygen each summer fell below 1.0 mg/l and sometimes fell to zero.
- In 1972, PL 92-500 required that (1) comprehensive plans be developed to the year 2000, (2) nonpoint source pollution be controlled, and (3) water quality be improved to protect fish and provide recreation where attainable.
- From 1972 to 1974, the COE Water Resources Management Study exerted pressure for a single regulatory "number" around which their alternative plans for water resource management could be developed.
- In 1973 and 1974, the water quality standard for the Chattahoochee River around Atlanta was being upgraded from 3 mg/l to 5 mg/l.
- In 1973 and 1974, newer projections of water withdrawal and wastewater generation showed that by the year 2000 the water situation would be much more critical than had been earlier anticipated.

Given these contextual circumstances, the Division's technical staff performed extensive analyses to develop a final policy number. These analyses included (1) an evaluation of data at low flow conditions to estimate the amount of river flow that might be reasonably expected by the year 2000, and (2) the application of mathematical water quality modeling, along with an examination of existing water quality data, to determine the amount of river flow necessary to assimilate the ever-increasing volumes of wastewater while simultaneously preserving the more stringent D.O. standard of 5 mg/l.

The hydrologic analyses were hampered by the lack of firm projections of

water demand by the year 2000. Nevertheless, these analyses were based on reservoir evaporation losses, available reservoir discharge agreements, peak projected water supply withdrawals, dry weather tributary flows, and critical period waste discharge conditions—all rolled into a mass balance, from Lake Sidney Lanier downstream to a point below the last waste discharge point in the Atlanta metro area.

As described in the July 1974 EPD public statement, a reasonable minimum flow to be equalled or exceeded 99% of the time at the Atlanta water intake was 915 cfs. The year 2000 projection of water withdrawal by Atlanta was 164 cfs. The net remaining minimum Chattahoochee River flow was, thus, $915 \text{ cfs} - 164 \text{ cfs} = 751 \text{ cfs}$, say 750 cfs.

Looking back over the conditions that existed when "The 750 cfs" decision was made two facts stand out: (1) the 750 cfs is not that much higher than people had already accepted as reasonable on the basis of their own analyses; and (2) the 750 cfs was determined on the basis of point source discharges and may be too low when one considers, in the future, increasing non-point source pollution, point source overflows and bypasses, and ever-increasing water demands that always seem to outstrip earlier predictions.

TABLE I. DISSOLVED OXYGEN: SELECTED SUMMARY OF MONTHLY GRAB SAMPLE DATA
IN THE CHATTAHOOCHEE RIVER 18.8 MILES BELOW
THE ATLANTA WATER INTAKE

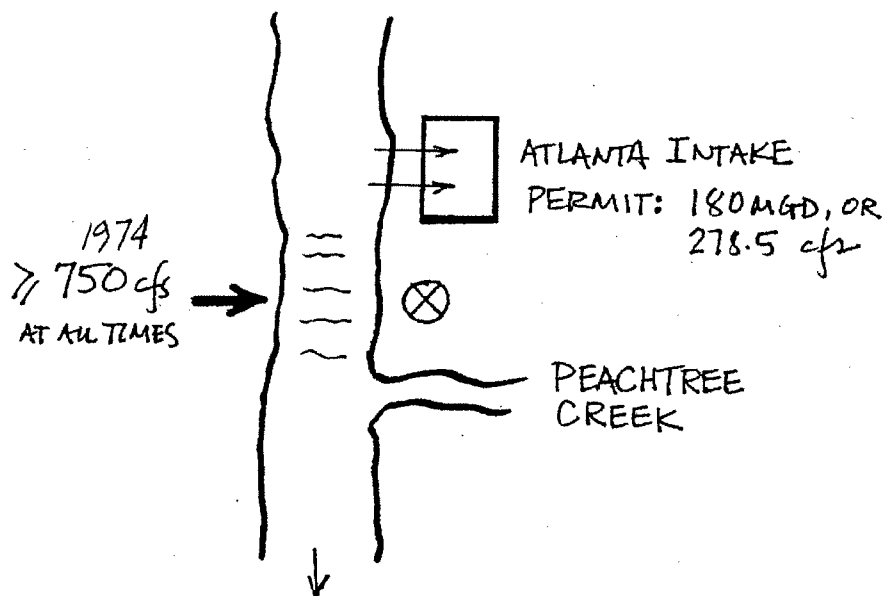
YEAR	DISSOLVED OXYGEN CONCENTRATIONS, mg/l				
	January	July	August	September	October
(a) before secondary treatment					
1968	8.8	3.5	1.0	4.5	0.9
1969	8.7	5.3	2.2	4.4	0.5
1970	7.0	4.2	1.8	0.7	6.1
1971	7.8	0.2	6.0	3.6	1.7
1972	8.7	1.0	3.7	3.5	0.5
1973	8.5	0.9	2.4	0.0	4.4
1974	8.8	2.7	4.1	5.4	5.5
Mean	8.3	2.5	3.0	3.2	2.7
(b) after secondary treatment					
1975	8.5	4.2	5.1	5.1	7.6
1976	10.1	6.2	5.1	—	5.4
1977	11.8	5.3	5.6	7.4	—
1978	11.1	5.5	7.2	8.6	8.4
1979	10.7	6.4	5.6	6.1	7.9
1980	9.9	5.1	5.3	5.5	7.9
Mean	10.4	5.5	5.7	6.5	7.4

TABLE II. DISSOLVED OXYGEN: ANNUAL SUMMARY OF MONTHLY GRAB SAMPLE DATA FOR THE CHATTAHOOCHEE RIVER AROUND ATLANTA

DISSOLVED OXYGEN CONCENTRATIONS, mg/l

YEAR	ANNUAL AVERAGE		ANNUAL MINIMUM	
	ATLANTA WATER INTAKE	18.8 MILES DOWNSTREAM	ATLANTA WATER INTAKE	18.8 MILES DOWNSTREAM
(a) Before Secondary Treatment				
1968	9.3	5.3	8.2	0.9
1969	9.7	5.1	8.5	0.5
1970	9.6	3.2	8.3	0.2
1971	9.6	4.8	8.6	0.2
1972	9.2	3.5	8.2	0.0
1973	9.4	4.8	8.4	0.0
1974	9.6	5.9	7.7	2.7
Mean	9.5	4.7	8.3	0.6
(b) After Secondary Treatment				
1975	9.7	6.8	8.5	4.1
1976	9.9	7.7	8.7	5.1
1977	9.4	7.7	8.1	5.3
1978	9.8	8.1	8.6	4.6
1979	9.9	7.8	8.1	6.1
1980	9.9	7.5	8.5	5.1
Mean	9.8	7.6	8.4	5.1

MINIMUM FLOW PROVISION



- o Why is it located there? Is that a good place?*
- o Should it be located elsewhere? Where?*

- o Why is the value 750 cfs? Should it be higher?*
- o Is a single, constant number valid? Should it vary?*

- o What purpose is served by the minimum flow provision?*
- o Should it serve other purposes? What purposes?*

- o Should Buford Dam make more water "available" to the system?*

FROM: RULES and REGULATIONS for
WATER QUALITY CONTROL,

Ga DNR, EPD, REV. 30 JULY 1996, p. 10.

(7) **Natural Water Quality.** It is recognized that certain natural waters of the State may have a quality that will not be within the general or specific requirements contained herein. This is especially the case for the criteria for dissolved oxygen, temperature, pH and fecal coliform. NPDES permits and best management practices will be the primary mechanisms for ensuring that discharges will not create a harmful situation.

(8) **Treatment Requirements.** Notwithstanding the above criteria, the requirements of the State relating to secondary or equivalent treatment of all waste shall prevail. The adoption of these criteria shall in no way preempt the treatment requirements.

(9) **Streamflows.** Specific criteria or standards set for the various parameters apply to all flows on regulated streams. On unregulated streams, they shall apply to all streamflows equal to or exceeding the 7-day, 10-year minimum flow (7Q10). All references to 7-day, 10-year minimum flow (7Q10) also apply to all flows on regulated streams. All references to annual average stream flow also apply to long-term average stream flow conditions.

(10) **Mixing Zone.** Effluents released to streams or impounded waters shall be fully and homogeneously dispersed and mixed insofar as practical with the main flow or water body by appropriate methods at the discharge point. Use of a reasonable and limited mixing zone may be permitted on receipt of satisfactory evidence that such a zone is necessary and that it will not create an objectionable or damaging pollution condition. Protection from acute toxicity shall be provided within any EPD designated mixing zone to ensure a zone of safe passage for aquatic organisms. The procedure is as described in paragraph 391-3-6-.06(4)(d)(5)(iv), except that the numerical pass/fail criteria applies to the end-of-pipe without the benefit of dilution provided by the receiving stream.

(11) **Toxic Pollutant Monitoring.** The Division will monitor waters of the State for the presence or impact of Section 307 (a)(1) Federal Clean Water Act toxic pollutants, and other priority pollutants. The monitoring shall consist of the collection and assessment of chemical and/or biological data as appropriate from the water column, from stream bed sediments, and/or from fish tissue. Specific stream segments and chemical constituents for monitoring shall be determined by the Director on the basis of the potential for water quality impacts from toxic pollutants from point or nonpoint waste sources. Singularly or in combination, these constituents may cause an adverse effect on fish propagation at levels lower than the criteria. Instream concentrations will be as described in 391-3-6-.03 (5)(d). Additional toxic substances and priority pollutants will be monitored on a case specific basis using Section 304(a) Federal Clean Water Act guidelines or other scientifically appropriate documents.

(12) **Specific Water Use Classifications.** Beneficial water uses assigned by the State to all surface waters. These classifications are scientifically determined to be the best utilization of the surface water from an environmental and economic standpoint. Streams and stream reaches not specifically listed are classified as Fishing. The specific classifications are as follows:

MINIMUM FLOW PROVISION CHATTAHOOCHEE RIVER

CHATTAHOOCHEE RIVER BASIN		CLASSIFICATION
Chattahoochee River	Headwaters to Buford Dam	Recreation
Chattahoochee River	Buford Dam to Atlanta (Peachtree Creek)	Drinking Water and Recreation
Chattahoochee River	Atlanta (Peachtree Creek) to Cedar Creek	Fishing ²
Chattahoochee River	New River to West Point Dam	Recreation
Chattahoochee River	West Point Dam to West Point Mfg Company Water Intake	Drinking Water
Chattahoochee River	Osanippa Creek to Columbus (North Highland Dam)	Recreation and Drinking Water
Chattahoochee River	Cowikee Creek to Great Southern Division of Great Northern Paper Company	Recreation
Chattahoochee River	Georgia Hwy. 91 (Neal's Landing) to Jim Woodruff Dam	Recreation
Big Creek	Georgia Hwy. 400 to City of Roswell Water intake	Drinking Water
Dog River	Headwaters to Dog River Reservoir	Drinking Water

SEE
FOOTNOTE

FOOTNOTE

- (1) Site specific criteria for this classification are minimum instantaneous and will apply throughout the water column. The dissolved oxygen criteria is no less than 3.0 mg/l in June, July, August, September, and October; no less than 3.5 mg/l in May and November; and no less than 4.0 mg/l in December, January, February, March, and April.
- (2) Specific criteria apply at all times when the river flow measured at a point immediately upstream from Peachtree Creek equals or exceeds 750 cfs (Atlanta gage flow minus Atlanta water supply withdrawal).
- (14) Trout Streams. Streams designated as Primary Trout Waters are waters supporting a self-sustaining population of Rainbow, Brown or Brook Trout. Streams designated as Secondary Trout Streams are those with no evidence of natural trout reproduction, but are capable of supporting trout throughout the year. Trout streams are classified in accordance with the designations and criteria as follows:
 - (a) Criteria.

Rev. July 1996

13

FROM: RULES and REGULATIONS for WATER QUALITY CONTROL,
CHAPTER 391-3-6, REVISED 30 JULY 1996.

MINIMUM FLOW PROVISIONS

3 APPARENT CONDITIONS

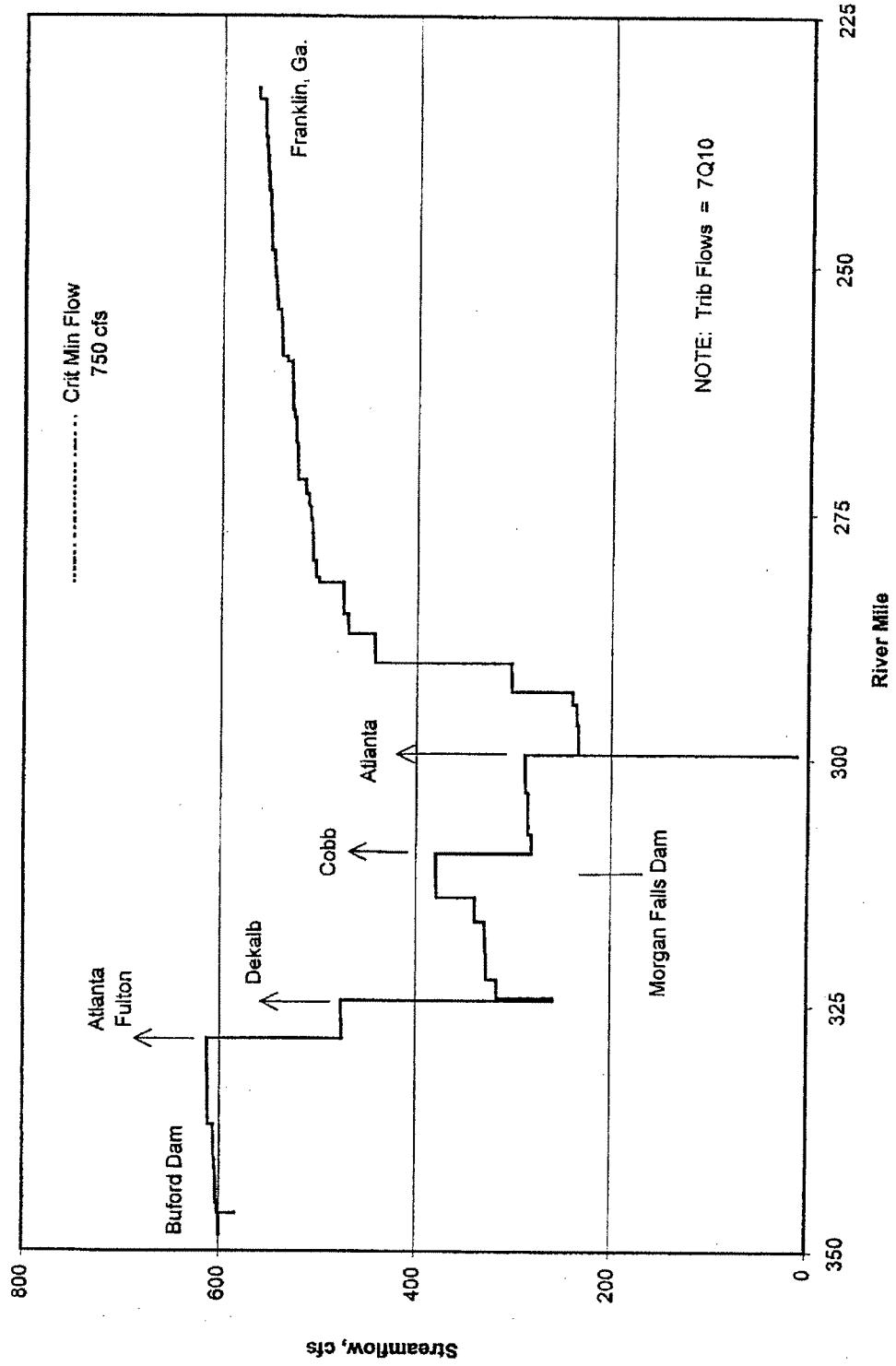
A. THE UNREGULATED PORTIONS

- TRIBUTARIES -- 7Q10

B. THE REGULATED PORTIONS

- UPSTREAM OF PEACHTREE CREEK
→ "ALL FLOWS"
- DOWNSTREAM of PEACHTREE CREEK
→ "GREATER THAN 750 cfs
AT ALL TIMES"

Streamflow at Steady-State Critical Conditions



Chattahoochee River Modeling Project
Environmental Protection Division
Atlanta, Georgia

750 CFS MINIMUM FLOW REQUIREMENT

Historical Development

- o 1947 -- Buford Dam Authorization (House Document No. 300, 80th Congress) required that releases from Buford Dam maintain a minimum flow at Atlanta of 650 cfs. This number did not take into account any intakes and discharges in between. It was based on one small "service" unit operating at 600 cfs, plus 50 cfs of dry weather tributary inflow.
- o 1958 -- Buford Dam operational.
- o 1960 -- The City recognized that a 650 cfs minimum at Atlanta would not be adequate to meet water supply demands and the need for assimilation of treated wastes. Atlanta entered into a joint agreement with Georgia Power Company to fund expansion of storage capacity at Morgan Falls Dam. This included an increase in spillway height to provide for a minimum flow of at least 750 cfs "above the Atlanta intake" at all times.
- o 1965 -- City of Atlanta Consultant's Report indicated that, at currently attainable wastewater treatment levels, this minimum flow would cause a serious depletion of River dissolved oxygen by 1985.
- o 1966 -- the Georgia Water Control Board proposed a revision of water quality standards from Peachtree Creek to Cedar Creek. The proposal would revise the classification from "industrial" to "fishing"; this would increase the minimum DO from 3 mg/l to 5 mg/l.
- o 1972-1974 -- EPD performed intensive surveys from Peachtree Creek to Franklin, Georgia, to develop the steady-state DOSag model later used for the Atlant Metro wasteload allocation. West Point Lake was under construction at that time.
- o March 1972 -- The Senate Public Works Committee resolution, 92nd Congress, authorized the *Metropolitan Atlanta Water Resources Study* (MAWRS). This effort, coordinated by the Savannah District Corps of Engineers, was intended to provide "a plan for the development, utilization, and conservation of water and related land resources for Atlanta, Georgia, and contiguous areas". Minimum flow requirements for wastewater assimilation at Atlanta were central to this Study. MAWRS also revised projections of future water supply withdrawals and wastewater treatment discharges for the study area.
- o October 1972 -- The *Federal Water Pollution Control Act of 1972*, Public Law 92-500, was enacted. The law required that all municipal facilities be upgraded to at least secondary treatment.

Chattahoochee River Modeling Project
Environmental Protection Division
Atlanta, Georgia

- o 17 July 1974 -- At a public meeting on the "Lake Sidney Lanier Project Review", Leonard Ledbetter outlined the Environmental Protection Division's policies for the protection of water quality in the Chattahoochee River from Buford Dam to West Point Lake. He announced that *"the flow in the Chattahoochee River at the point between the existing City of Atlanta water intake and Peachtree Creek must not be less than 750 cfs at any time."*
- o August 1975 -- EPA Region IV approved the revision of water quality standards proposed in 1966.
- o Late 1970's -- EPD developed the Atlanta Metro wasteload allocation using the 750 cfs at Peachtree Creek as the critical "headwater flow" for the Dosag model developed several years earlier.
- o January 1992 -- *Memo of Understanding*, authorizing the Tri-State Comprehensive Study, signed by contending parties.
- o June 1992 -- The Division initiates the Chattahoochee River Modeling.

File: D:/Seminar/Arc/18sep97/750hist.wpd

MINIMUM FLOW PROVISION

Why, How, and Where?

o Why is it located at that unusual spot?

"Only because the original Dosag model started there and thus needed a constant headwater flow value to begin DO calculations."

o How was the "750 cfs" number developed?

Step 1: the historic record at Paces Ferry Road showed that an average flow of 915 cfs was equaled or exceeded 99 days out of 100.

Step 2: at that time, the maximum withdrawal at the Atlanta intake was assumed to be 164 cfs. (It's now 278.5 cfs.)

Step 3: the minimum flow below the Atlanta intake thus equals the minimum flow at Paces Ferry Road minus the maximum withdrawal at Atlanta; or, 915 minus 164 equals 751 cfs. This result was then rounded off to 750 cfs.

o Is that a good location?

No. There's nothing special about that point in the River for regulatory decisions. Moreover, it's difficult to implement Model scenarios with the minimum flow target wedged in between the Intake and Peachtree Creek.

o Where should minimum flows be specified?

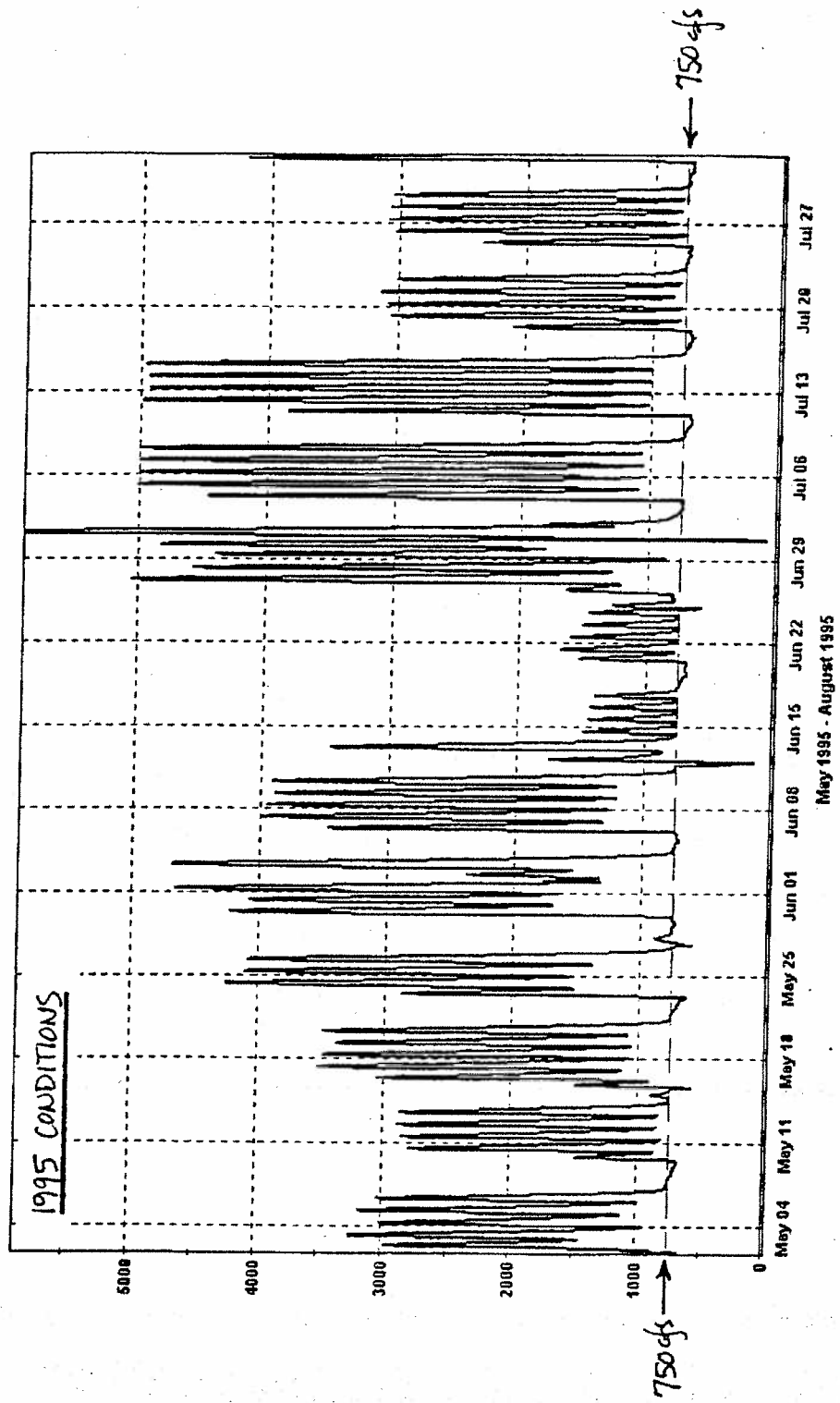
Two places. Buford Dam primarily; and, Morgan Falls Dam for its re-regulation capability.

MINIMUM FLOW PROVISION

Policy Choices and Problem Solving

- o There is nothing unique or special about the current location of the 750 cfs at Peachtree Creek. In fact, it should be relocated and the flow value changed to reflect the relocation.
- o The 750 cfs minimum flow provision did not come from any model. It derived from a "policy choice" to work with the amount of water currently available in the system.
- o Thus, the concept of "water available" can also be used today to evaluate issues and solve problems, including TMDLs.
- o If we accept this concept, then the next policy question becomes "should we make more water fundamentally available than currently exists?" This can only be accomplished by systematically releasing more water from Buford Dam.
- o If we want more water from Buford Dam then we must be clear about the question "for what purpose". That purpose can only be "to solve problems or satisfy needs downstream".
- o Accordingly, "do we have the right" to ask Buford Dam to put more water into the system to solve problems created by others downstream? (Given that Buford Dam takes care of its own problems, like low DO releases.) Or, put another way, should not those who create problems be expected to solve them.
- o What are the problems that can be solved downstream by releasing more water from Buford Dam? To answer that we need to distinguish between: (1) short-term operational releases; and, (2) long-term flow increases. Also, we need to look at the problems that were solved in 1974 compared to the problems that exist today.

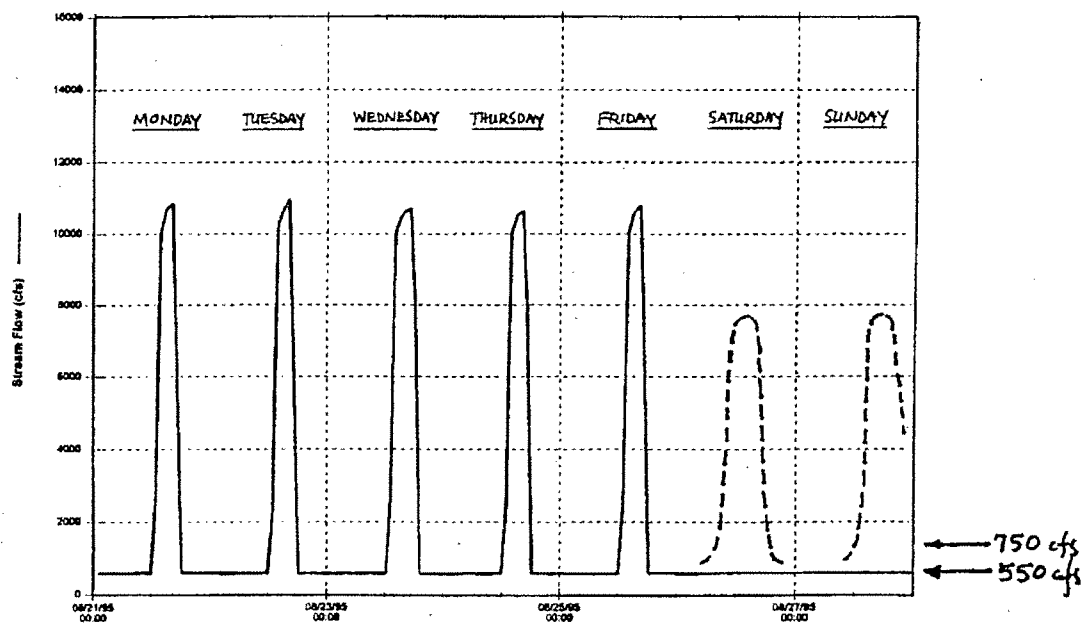
STREAMFLOW (cfs) ABOVE PEACHTREE CREEK W. "PIPES AT PERMIT"



MINIMUM FLOW PROVISION

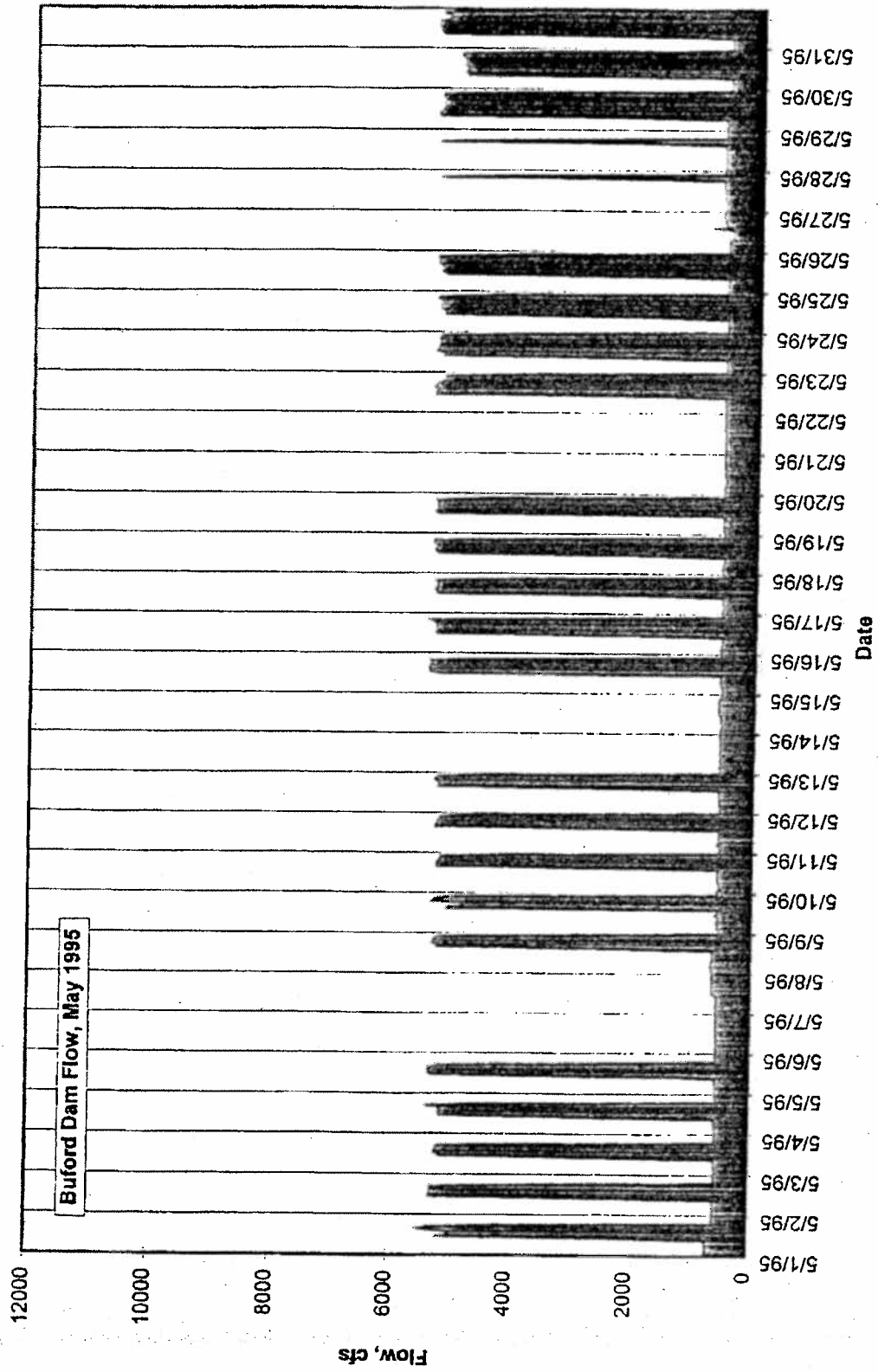
More Water From Buford Dam?

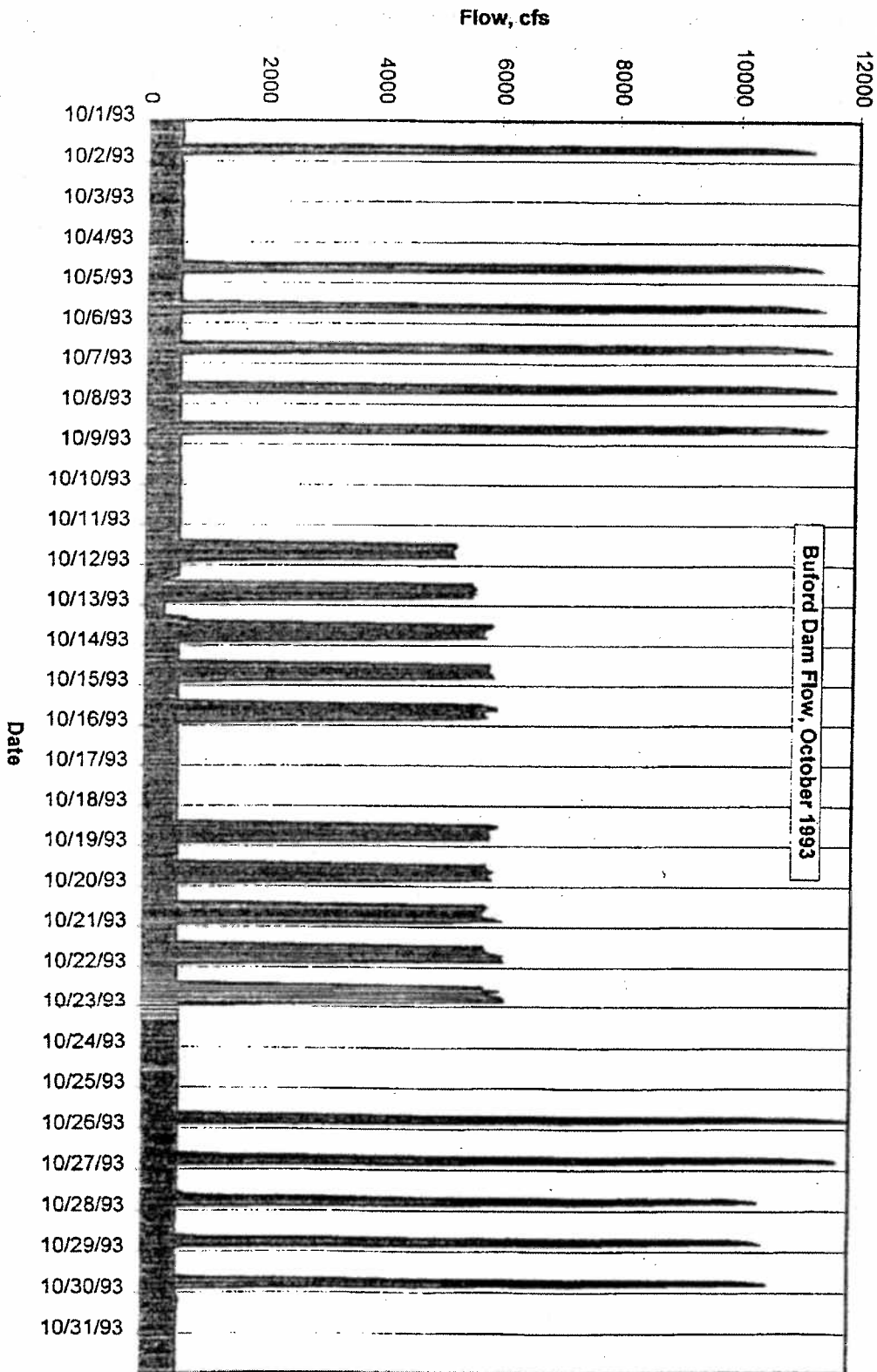
- o Short-term operational release: a real-time change in operation to solve an immediate problem. Example, the operator at Morgan Falls Dam calls Buford and asks for more water to meet minimum flow needs at Peachtree on the weekend.
- o Long-term flow increases: fundamental changes in operation.



1. Always add more water on weekends.
2. Raise the minimum release from 550cfs to a higher value.
3. Revise the power generation pattern -- flow and duration.

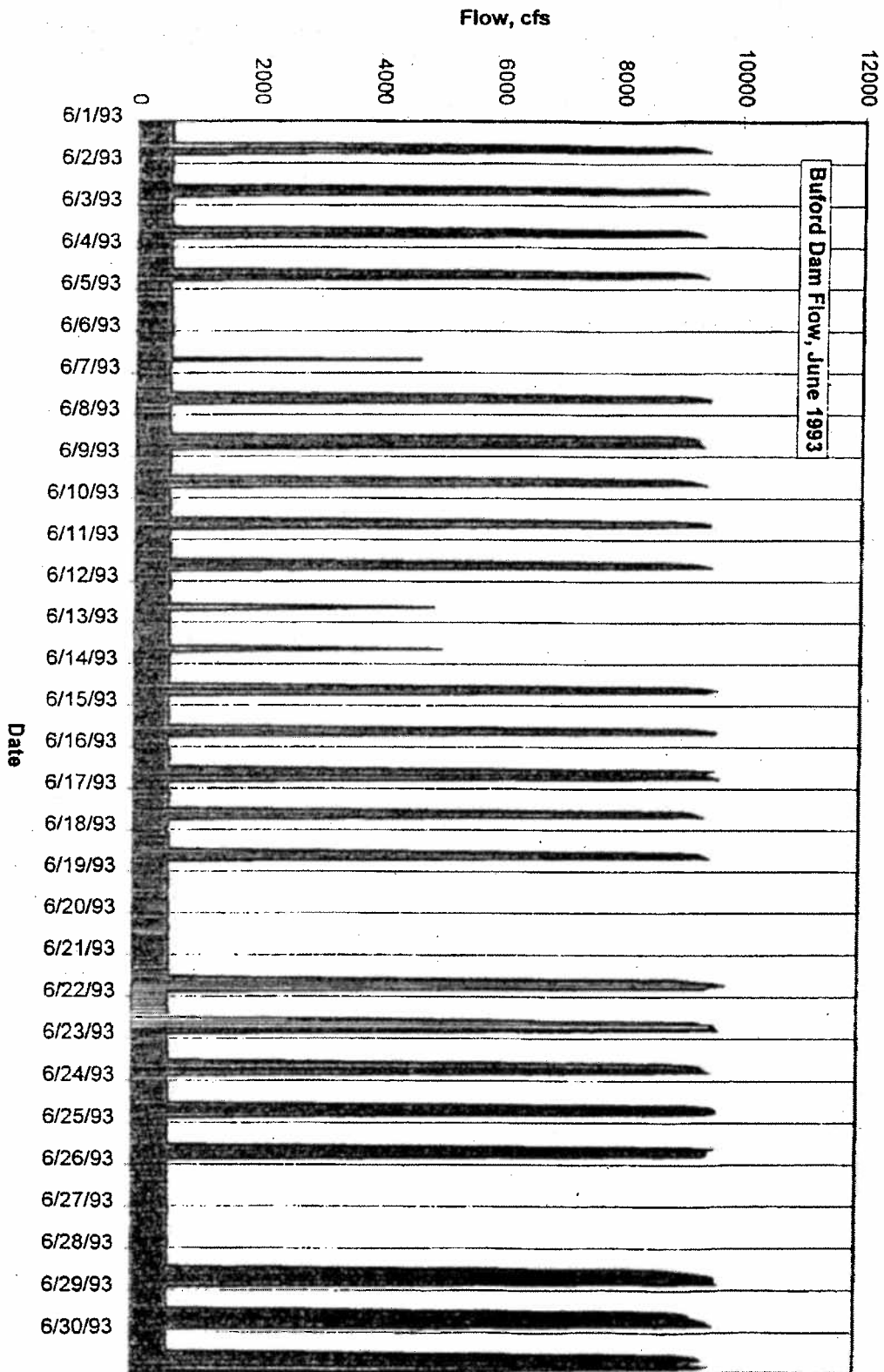
Chattahoochee River Modeling Project
Environmental Protection Division





Chattahoochee River Modeling Project
Environmental Protection Division

Chattahoochee River Modeling Project
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Chattahoochee River Modeling Project
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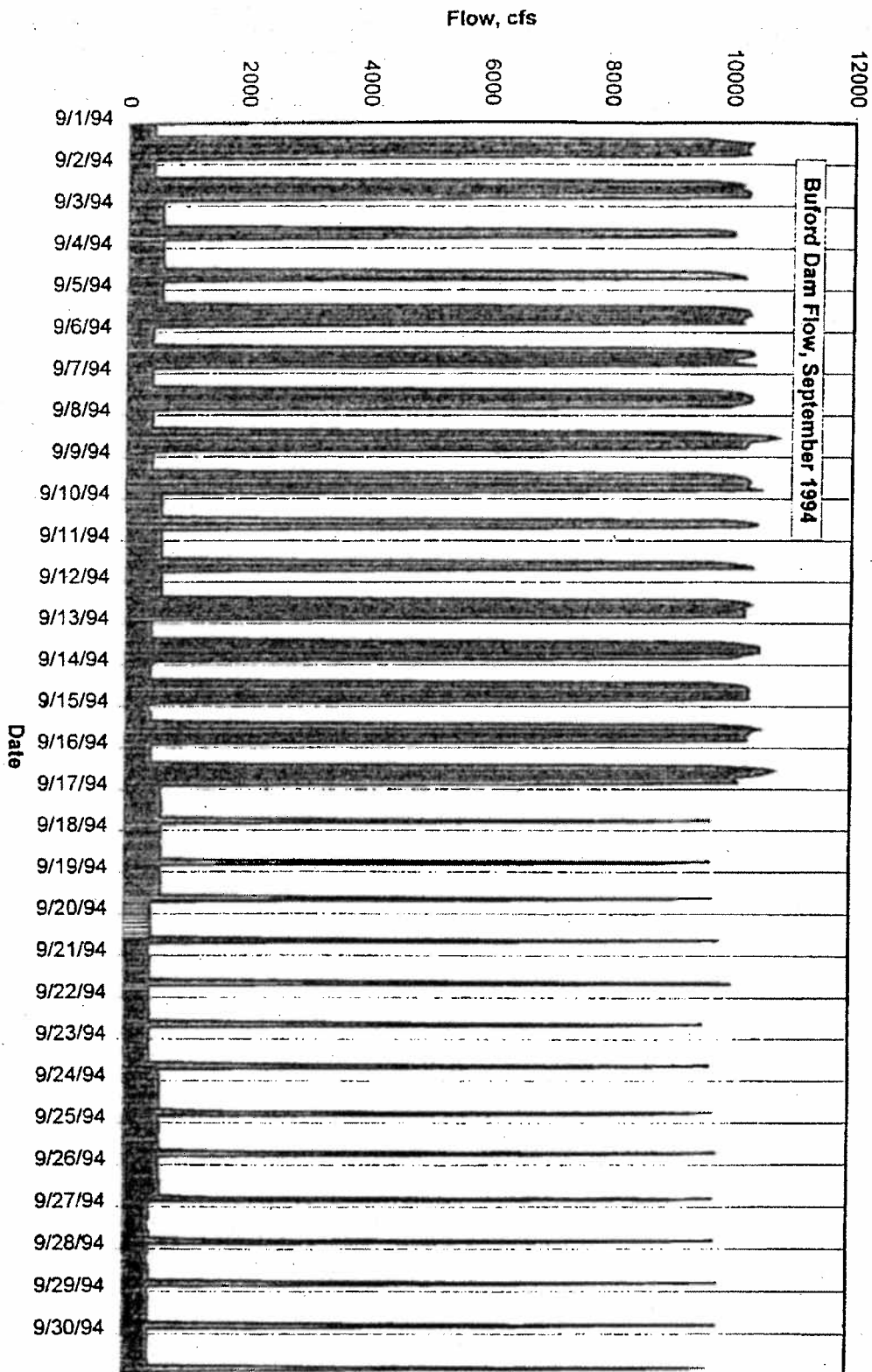


TABLE I. DISSOLVED OXYGEN: SELECTED SUMMARY OF MONTHLY GRAB SAMPLE DATA
IN THE CHATTAHOOCHEE RIVER 18.8 MILES BELOW
THE ATLANTA WATER INTAKE

YEAR	DISSOLVED OXYGEN CONCENTRATIONS, mg/l				
	January	July	August	September	October
(a) before secondary treatment					
1968	8.8	3.5	1.0	4.5	0.9
1969	8.7	5.3	2.2	4.4	0.5
1970	7.0	4.2	1.8	0.7	6.1
1971	7.8	0.2	6.0	3.6	1.7
1972	8.7	1.0	3.7	3.5	0.5
1973	8.5	0.9	2.4	0.0	4.4
1974	8.8	2.7	4.1	5.4	5.5
Mean	8.3	2.5	3.0	3.2	2.7
(b) after secondary treatment					
1975	8.5	4.2	5.1	5.1	7.6
1976	10.1	6.2	5.1	—	5.4
1977	11.8	5.3	5.6	7.4	—
1978	11.1	5.5	7.2	8.6	8.4
1979	10.7	6.4	5.6	6.1	7.9
1980	9.9	5.1	5.3	5.5	7.9
Mean	10.4	5.5	5.7	6.5	7.4

TABLE II. DISSOLVED OXYGEN: ANNUAL SUMMARY OF MONTHLY GRAB SAMPLE DATA
FOR THE CHATTAHOOCHEE RIVER AROUND ATLANTA

DISSOLVED OXYGEN CONCENTRATIONS, mg/l

YEAR	ANNUAL AVERAGE		ANNUAL MINIMUM	
	ATLANTA WATER INTAKE	18.8 MILES DOWNSTREAM	ATLANTA WATER INTAKE	18.8 MILES DOWNSTREAM
(a) Before Secondary Treatment				
1968	9.3	5.3	8.2	0.9
1969	9.7	5.1	8.5	0.5
1970	9.6	3.2	8.3	0.2
1971	9.6	4.8	8.6	0.2
1972	9.2	3.5	8.2	0.0
1973	9.4	4.8	8.4	0.0
1974	9.6	5.9	7.7	2.7
Mean	9.5	4.7	8.3	0.6
(b) After Secondary Treatment				
1975	9.7	6.8	8.5	4.1
1976	9.9	7.7	8.7	5.1
1977	9.4	7.7	8.1	5.3
1978	9.8	8.1	8.6	4.6
1979	9.9	7.8	8.1	6.1
1980	9.9	7.5	8.5	5.1
Mean	9.8	7.6	8.4	5.1

EVOLUTION OF THE 750 CFS

September 1983

ROY BURKE "11"

I. INTRODUCTION

On 17 July 1974, at a public meeting on "Lake Sidney Lanier Project Review", the Georgia Environmental Protection Division outlined its policies for the protection of water quality in the Chattahoochee River between Buford Dam and West Point Dam. Included in this broad statement was the announcement that "the flow in the Chattahoochee River at the point between the existing City of Atlanta water intake and Peachtree Creek must not be less than 750 cfs at any time." The technical analyses supporting this number had been performed, and necessary regulations had been officially adopted, during the preceding year. However, 17 July 1974 is often cited as the date on which "the 750 cfs" became official.

Since then, the 750 cfs has become identified as the minimum flow in the Chattahoochee River, below the Atlanta water intake, required for adequate dilution of wastewater discharges from the metropolitan area. Furthermore, because the 750 cfs was adopted by the Environmental Protection Division, that number has been narrowly viewed as reflecting only the concern for wastewater dilution. However, the technical staff of EPD incorporated other important factors to arrive eventually at a figure (750 cfs) which reasonably balanced the major issues being expressed at that time.

For example, a river flow of 750 cfs corresponds to a specific level of required waste treatment which corresponds to specific costs. Assumed river flow less than 750 cfs will cause treatment costs to rise; flows greater will cause costs to drop. If the 750 cfs figure related only to treatment cost minimization for wastewater dilution then higher flows would have been adopted. However, higher

flows (required at Atlanta) mean less water available upstream for multipurpose use at Lake Sidney Lanier and from Buford Dam downstream to Atlanta by way of Morgan Falls Dam. Higher flows required at Atlanta thus increase conflicts with upstream multiple uses already established by contract, and increase the hydrologic uncertainty associated with assuming higher minimum flows. Thus, the 750 cfs reflects a balance between increasing waste treatment costs, increasing water use conflicts, and increasing hydrologic uncertainties, given that water quality standards were also (at that time) being upgraded from the "industrial" to "fishing" classification.

II. BACKGROUND

The analyses and decisions leading up to the announced policy of 750 cfs minimum occurred 10 years ago. After the passage of a decade, the circumstances surrounding and preceding these actions tend to fade from view and lose their impact. Thus, a brief review of the relevant events affecting the 1974 decision will help keep in perspective the major issues of that time.

A. Buford Dam and Lake Sidney Lanier

Buford Dam was constructed by the Corps of Engineers in 1958. Early studies leading to the construction of Buford Dam even then emphasized the need for flow augmentation in the Chattahoochee River to protect water quality against increases in waste discharges. Thus, the Congressional Document (House Document No. 300, 80th Congress, First Session, 1947) required that minimum releases from Buford should be such that a minimum flow at Atlanta of 650 cfs be maintained at all

times. This 650 cfs did not account for any withdrawals by Atlanta or any intake upstream between Lake Lanier and the City of Atlanta. One small turbine at Buford was to be operated at 600 cfs, at all times, assuming that local tributary inflows below the dam would seldom drop lower than 50 cfs. In the early 1950's, this was more than sufficient to meet water demands and provide some additional amount for water quality, which was not of major concern at that time. The average water supply withdrawal by Atlanta in 1950 was 85 cfs. The minimum recorded daily flow in the Chattahoochee River before construction of Buford Dam was 296 cfs at Atlanta in September 1957, so 650 cfs was a considerable increase in minimum flow.

B. Morgan Falls Dam

Morgan Falls Dam, located 36 miles downstream from Buford Dam and 12 miles upstream from Atlanta, began producing electric power in October 1904. Shortly after Buford Dam was constructed in 1958, the City of Atlanta had already recognized that 650 cfs total minimum flow in the river was not adequate after upstream withdrawals. Thus, in 1960, Atlanta funded the expansion of storage capacity at Morgan Falls Dam, jointly with Georgia Power Company, in order to guarantee a minimum release from Morgan Falls of 750 cfs. (This did not include tributary inflows downstream.) The City of Atlanta and Cobb County could withdraw their water supply needs and the remainder would be available for wastewater dilution. (The City of Atlanta, like most major cities in Georgia, did not progress from primary to secondary treatment of wastewater until the early 1970's. The City made a request to Georgia Power to assist in devising some method of reregulating flows released by Buford Dam to assure a sufficient flow for "proper disposition

of sewage.") The agreement between the City of Atlanta and the Georgia Power Company as to the raising of the dam and the subsequent operation of the project is stated in a contract dated September 6, 1957. Georgia Power Company's commitments to the City of Atlanta as defined in that contract call for the release of water according to a specified schedule. According to the schedule, releases from the Morgan Falls Dam shall be such as to provide a minimum flow of at least 750 cfs at all times at Atlanta (above the Atlanta intake) and to provide flows in excess of 750 cfs in the Atlanta area in the daytime.

C. December 1965, Consultant's Report

In December 1965 a local consultant submitted to the City of Atlanta their findings and recommendations for the treatment of the City's wastewater discharged to the Chattahoochee River. The statements below were taken from the Letter of Transmittal accompanying their final report:

"The quality of the water pollution control plant effluents discharged to the Chattahoochee will conform to requirements stipulated by the State of Georgia Water Quality Control Board that an 85 per cent degree of treatment will be necessary to produce relatively stable plant effluents, virtually eliminating harmful bacteria by chlorination and maintaining an ample dissolved oxygen content in the river water as it passes the treatment plants.

"This required degree of treatment can readily be met by the R. M. Clayton Plant dependent solely upon minimum average weekly releases of 1600 cubic feet per second from Buford Dam in accordance with the method of operation provided by the 80th Congress in 1947 when construction of the dam was authorized. As time goes on, however, it will be necessary to obtain increased minimum flow releases from Buford Dam or to provide complete reregulation of the river to obtain this minimum flow coincident with peak effluent discharges from Clayton Plant.

"The same degree of treatment can also be met by the Utoy Creek and Sandy Creek Plants during minimum average weekly flows and present conditions of river temperature until about the year 1985. River temperatures are raised by steam-electric generating plants Atkinson and McDonough below Clayton Plant and again

at the Yates steam-electric generating plant downstream to such an extent that the estimated oxygen content of the river water will be seriously depleted at minimum flow by the year 1985. Remedies may be found either by curtailing steam plant operations during minimum river flow, by increased river flow through changes in regulation, or by discovery and employment of new methods of waste treatment to obtain higher removals of organics....

"Maintenance of the desired river water quality also depends upon the right of the Atlanta metropolitan area to use of the free flowing river for assimilation of its wastes after giving them the highest practical degree of treatment. Downstream impoundments proposed for the Chattahoochee near Atlanta will destroy the self-purification power of the river to such an extent that water quality in the nearest downstream reservoir will not be safe for unlimited recreational or water supply use. Here again the responsibility does not rest with the Atlanta Metropolitan Sewer System, but any remedies adopted should be chargeable to the cost of constructing the impoundments."

D. Deterioration of Chattahoochee River water quality

Georgia's Trend Monitoring Network has been in operation since 1968.

Conclusions drawn from early trend monitoring reports best describe water quality conditions in the Chattahoochee River 10 to 15 years ago:

"Beginning at the R. M. Clayton wastewater treatment plant just below Atlanta's water intake, the Chattahoochee River is characterized by poor water quality for a reach of some seventy miles, of which the first forty miles are considered grossly polluted...inadequately treated wastewaters from the metropolitan area in general, but primarily from the City of Atlanta, are responsible for these problems."

The river was found to be in near septic condition during the hot, dry months of July through October rendering it entirely unsatisfactory for all legitimate uses for at least 40 miles.

Table 1 contains data describing early dissolved oxygen problems at Highway 92. Each dissolved oxygen value reflects a single "grab" sample, that is, the prevailing value when the sample was dipped. These are, therefore, instantaneous values and are not daily averages. At this point, three observations can be made.

First, hot weather induces dissolved oxygen problems. From 1968-1974 dissolved oxygen in January varied around 8 mg/l. During the same period, July, August, September and October averaged around 2.9 mg/l, a 64% reduction. Second, the minimum D.O. standard of 4 mg/l is violated in 64% of the samples grabbed in July through October for the period 1968-1974. And, third, near septic conditions occur frequently with D.O. dropping to 0.0 mg/l in September 1973.

Table 2 contains data describing the effects on dissolved oxygen created by municipal sewage. Each value in the table is an annual average of monthly grab samples for that year. Two features of Table 2 are relevant. First, upstream and downstream D.O. values can be compared side-by-side. And, second, annual minimums can be compared to annual averages. In all cases, D.O. values at Highway 92 are substantially lower than those at the Atlanta Water Intake. This depression in D.O. is a result of municipal sewage discharges. In all cases, the water approaching Atlanta from the North is clean and healthy with respect to D.O. levels averaging above 9.0 mg/l and ranging no lower than 8.0 mg/l. In all cases, from 1968 to 1974, annual minimum D.O. at Highway 92 dropped to septic levels typically below 1 mg/l.

E. October 1972, The Federal Water Pollution Control Act (PL 92-500)

After October 1972, PL 92-500 required that each state conform to a uniform approach to water quality management. This approach included NPDES permits, Federal cost-sharing of municipal treatment plant construction, scientifically determined effluent limits, increased emphasis on the control of nonpoint source pollution (including combined sewer overflows), triennial review of water quality

standards, and comprehensive long-range water quality planning on an areawide basis. As an outgrowth of PL 92-500, Georgia had developed its 1st Edition Basin Plans specifying water pollution control needs to the year 2000, by the time decisions had to be made on the 750 cfs flow value. Thus, the fresh impetus to water quality control, provided by a far-reaching new Federal law, was being felt very strongly in 1973-74.

F. Corps of Engineers, Water Resources Management Study

The Metropolitan Atlanta Water Resources Study was authorized by resolution adopted 2 March 1972 by the Committee on Public Works, US Senate, 92nd Congress, 2nd Session. According to this resolution, the study was supposed to provide "a plan for the development, utilization, and conservation of water and related land resources for Atlanta, Georgia, and contiguous areas." Central to the completion of this study was the determination of minimum flow requirements for waste dilution in the Atlanta metropolitan area. Thus, in 1973 and 1974 great pressure was being exerted by several water-related agencies, involved in this study, for "a number" so the study could proceed unimpeded to its formal conclusion.

G. Water quality standards

In a letter dated 18 August 1975, the Administrator of EPA Region IV approved the revision of the use classification for the Chattahoochee River, from Peachtree Creek to Cedar Creek, from "industrial" to "fishing". This revised the minimum water quality standard for dissolved oxygen from 3 mg/l to 5 mg/l, expressed as a daily average. However, even though the standards revision was not approved until

August 1975, the anticipation of "upgrading" for the Chattahoochee River was felt two years earlier. Thus, the expected requirement to meet more stringent water quality standards was an essential ingredient in deliberations leading up to adoption of the 750 cfs.

H. Water use projections

Public works for water supply and wastewater disposal are always based on future projections of demand and need. Prior to 1974, these projections could be found in documents like the 1965 Consultant's Report. However, the COE Metropolitan Atlanta Area Water Resources Management Study and the studies incorporated into the Division's 1st Edition Basin Plans revealed that existing projections of water supply demands and wastewater generation were substantially underestimated. More water was expected to be withdrawn for water supply, and more wastewater was expected to be generated by the year 2000 than earlier studies had shown. For instance, in 1974 data showed that, at low-flow conditions, 6.4 cfs of river flow was available to dilute each cfs of waste flow. By the year 2000, at low flow conditions, there would be only 1 cfs of river flow available for each cfs of waste flow.

III. DEVELOPMENT OF THE 750 CFS

Thus in 1974, when an official "number" was needed, there were a variety of prior conditions and pressing issues incorporated into the analysis.

- The 1947 Congressional Documents had already required a minimum of 650 cfs at the Atlanta water intake.
- The City of Atlanta had contracted with Georgia Power, in September 1957, to share the cost of raising the pool elevations behind Morgan

Falls Dam to guarantee a minimum of 750 cfs from Morgan Falls, at all times.

- As early as 1965, consulting engineers (1) identified the need to increase minimum flow releases from Buford Dam to dilute anticipated waste discharges, (2) projected that the oxygen content of the Chattahoochee would be seriously depleted at low flow by 1985, and (3) concluded that downstream reservoirs would destroy the self-purification power of the river.
- By 1968, water quality in the Chattahoochee River around Atlanta had deteriorated, because of municipal sewage discharges, to the extent that dissolved oxygen each summer fell below 1.0 mg/l and sometimes fell to zero.
- In 1972, PL 92-500 required that (1) comprehensive plans be developed to the year 2000, (2) nonpoint source pollution be controlled, and (3) water quality be improved to protect fish and provide recreation where attainable.
- From 1972 to 1974, the COE Water Resources Management Study exerted pressure for a single regulatory "number" around which their alternative plans for water resource management could be developed.
- In 1973 and 1974, the water quality standard for the Chattahoochee River around Atlanta was being upgraded from 3 mg/l to 5 mg/l.
- In 1973 and 1974, newer projections of water withdrawal and wastewater generation showed that by the year 2000 the water situation would be much more critical than had been earlier anticipated.

Given these contextual circumstances, the Division's technical staff performed extensive analyses to develop a final policy number. These analyses included (1) an evaluation of data at low flow conditions to estimate the amount of river flow that might be reasonably expected by the year 2000, and (2) the application of mathematical water quality modeling, along with an examination of existing water quality data, to determine the amount of river flow necessary to assimilate the ever-increasing volumes of wastewater while simultaneously preserving the more stringent D.O. standard of 5 mg/l.

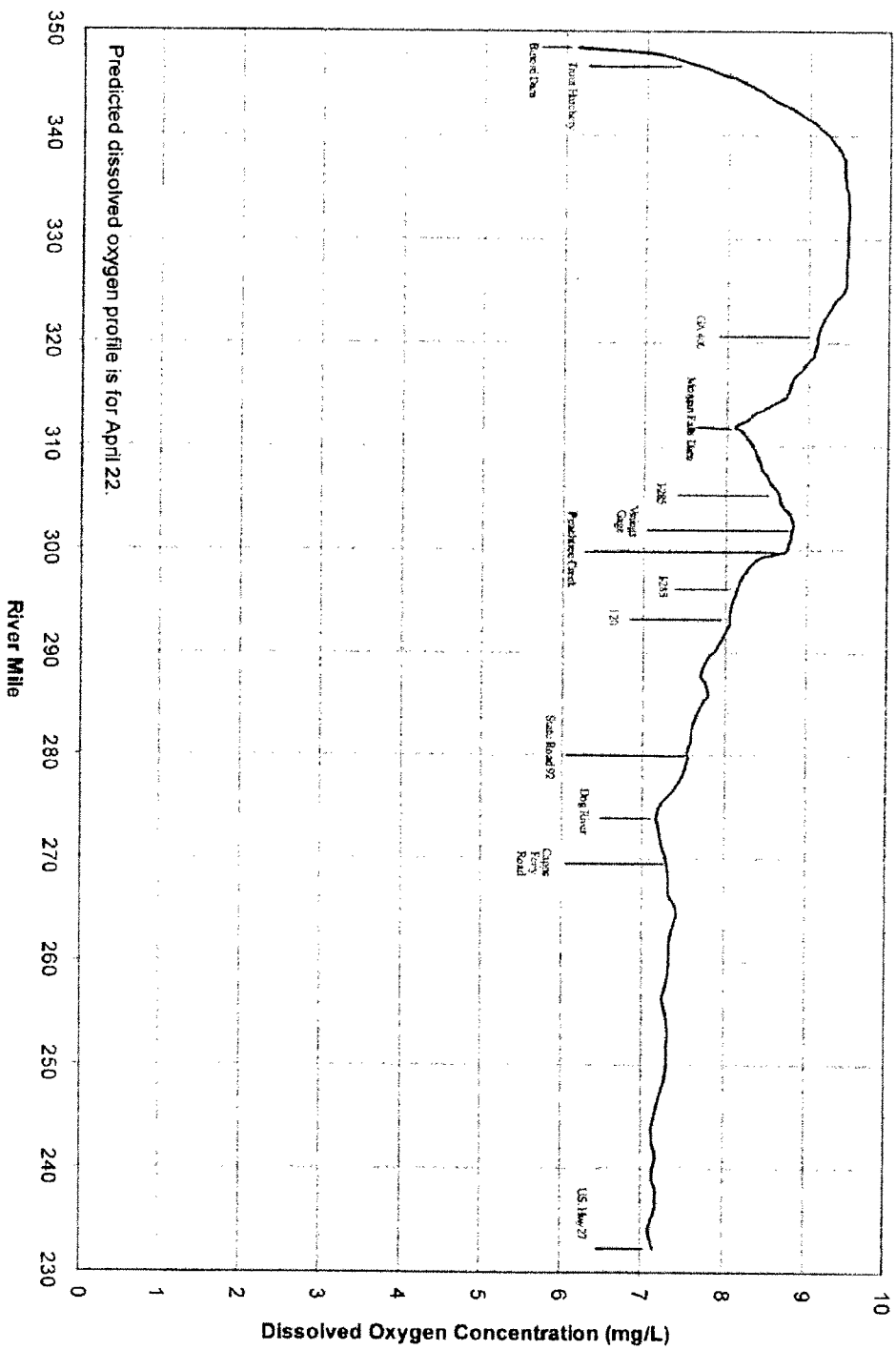
The hydrologic analyses were hampered by the lack of firm projections of

water demand by the year 2000. Nevertheless, these analyses were based on reservoir evaporation losses, available reservoir discharge agreements, peak projected water supply withdrawals, dry weather tributary flows, and critical period waste discharge conditions—all rolled into a mass balance, from Lake Sidney Lanier downstream to a point below the last waste discharge point in the Atlanta metro area.

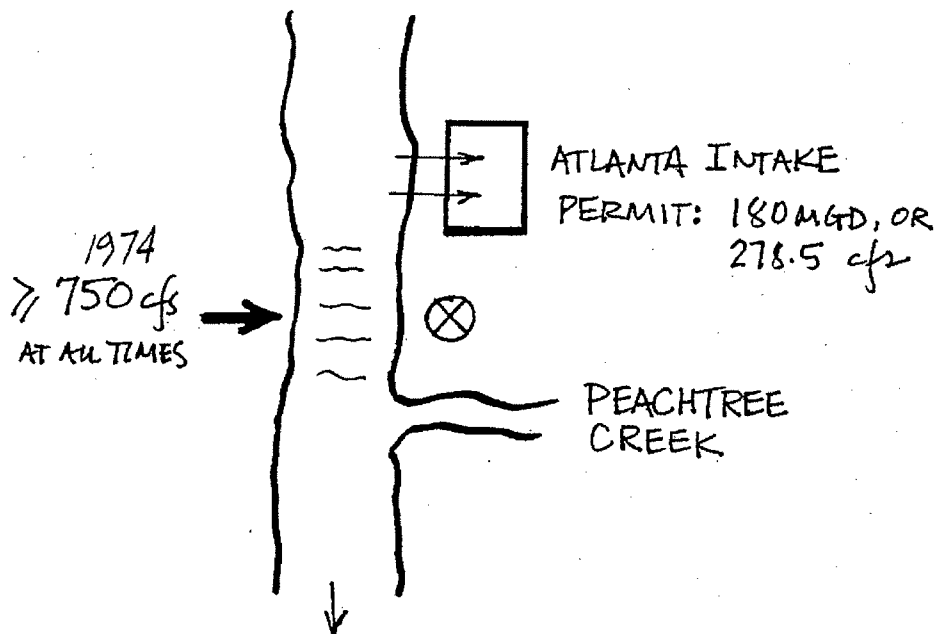
As described in the July 1974 EPD public statement, a reasonable minimum flow to be equalled or exceeded 99% of the time at the Atlanta water intake was 915 cfs. The year 2000 projection of water withdrawal by Atlanta was 164 cfs. The net remaining minimum Chattahoochee River flow was, thus, $915 \text{ cfs} - 164 \text{ cfs} = 751 \text{ cfs}$, say 750 cfs.

Looking back over the conditions that existed when "The 750 cfs" decision was made two facts stand out: (1) the 750 cfs is not that much higher than people had already accepted as reasonable on the basis of their own analyses; and (2) the 750 cfs was determined on the basis of point source discharges and may be too low when one considers, in the future, increasing non-point source pollution, point source overflows and bypasses, and ever-increasing water demands that always seem to outstrip earlier predictions.

Figure 1
Predicted Chattahoochee River Dissolved Oxygen Profile
for Minimum Streamflow of 650 cfs at Peachtree Creek



MINIMUM FLOW PROVISION



- o Why is it located there? Is that a good place?*
- o Should it be located elsewhere? Where?*

- o Why is the value 750 cfs? Should it be higher?*
- o Is a single, constant number valid? Should it vary?*

- o What purpose is served by the minimum flow provision?*
- o Should it serve other purposes? What purposes?*

- o Should Buford Dam make more water "available" to the system?*

FROM: RULES and REGULATIONS for
WATER QUALITY CONTROL,

Ga DNR, EPD, REV. 30 JULY 1996, p. 10.

(7) **Natural Water Quality.** It is recognized that certain natural waters of the State may have a quality that will not be within the general or specific requirements contained herein. This is especially the case for the criteria for dissolved oxygen, temperature, pH and fecal coliform. NPDES permits and best management practices will be the primary mechanisms for ensuring that discharges will not create a harmful situation.

(8) **Treatment Requirements.** Notwithstanding the above criteria, the requirements of the State relating to secondary or equivalent treatment of all waste shall prevail. The adoption of these criteria shall in no way preempt the treatment requirements.

(9) **Streamflows.** Specific criteria or standards set for the various parameters apply to all flows on regulated streams. On unregulated streams, they shall apply to all streamflows equal to or exceeding the 7-day, 10-year minimum flow (7Q10). All references to 7-day, 10-year minimum flow (7Q10) also apply to all flows on regulated streams. All references to annual average stream flow also apply to long-term average stream flow conditions.

(10) **Mixing Zone.** Effluents released to streams or impounded waters shall be fully and homogeneously dispersed and mixed insofar as practical with the main flow or water body by appropriate methods at the discharge point. Use of a reasonable and limited mixing zone may be permitted on receipt of satisfactory evidence that such a zone is necessary and that it will not create an objectionable or damaging pollution condition. Protection from acute toxicity shall be provided within any EPD designated mixing zone to ensure a zone of safe passage for aquatic organisms. The procedure is as described in paragraph 391-3-6-.06(4)(d)(5)(iv), except that the numerical pass/fail criteria applies to the end-of-pipe without the benefit of dilution provided by the receiving stream.

(11) **Toxic Pollutant Monitoring.** The Division will monitor waters of the State for the presence or impact of Section 307 (a)(1) Federal Clean Water Act toxic pollutants, and other priority pollutants. The monitoring shall consist of the collection and assessment of chemical and/or biological data as appropriate from the water column, from stream bed sediments, and/or from fish tissue. Specific stream segments and chemical constituents for monitoring shall be determined by the Director on the basis of the potential for water quality impacts from toxic pollutants from point or nonpoint waste sources. Singularly or in combination, these constituents may cause an adverse effect on fish propagation at levels lower than the criteria. Instream concentrations will be as described in 391-3-6-.03 (5)(d). Additional toxic substances and priority pollutants will be monitored on a case specific basis using Section 304(a) Federal Clean Water Act guidelines or other scientifically appropriate documents.

(12) **Specific Water Use Classifications.** Beneficial water uses assigned by the State to all surface waters. These classifications are scientifically determined to be the best utilization of the surface water from an environmental and economic standpoint. Streams and stream reaches not specifically listed are classified as Fishing. The specific classifications are as follows:

MINIMUM FLOW PROVISION CHATTAHOOCHEE RIVER

CHATTAHOOCHEE RIVER BASIN		CLASSIFICATION
Chattahoochee River	Headwaters to Buford Dam	Recreation
Chattahoochee River	Buford Dam to Atlanta (Peachtree Creek)	Drinking Water and Recreation
Chattahoochee River	Atlanta (Peachtree Creek) to Cedar Creek	Fishing ²
Chattahoochee River	New River to West Point Dam	Recreation
Chattahoochee River	West Point Dam to West Point Mfg Company Water Intake	Drinking Water
Chattahoochee River	Osanippa Creek to Columbus (North Highland Dam)	Recreation and Drinking Water
Chattahoochee River	Cowikee Creek to Great Southern Division of Great Northern Paper Company	Recreation
Chattahoochee River	Georgia Hwy. 91 (Neal's Landing) to Jim Woodruff Dam	Recreation
Big Creek	Georgia Hwy. 400 to City of Roswell Water intake	Drinking Water
Dog River	Headwaters to Dog River Reservoir	Drinking Water

SEE
FOOTNOTE

FOOTNOTE

- (1) Site specific criteria for this classification are minimum instantaneous and will apply throughout the water column. The dissolved oxygen criteria is no less than 3.0 mg/l in June, July, August, September, and October; no less than 3.5 mg/l in May and November; and no less than 4.0 mg/l in December, January, February, March, and April.
 - (2) Specific criteria apply at all times when the river flow measured at a point immediately upstream from Peachtree Creek equals or exceeds 750 cfs (Atlanta gage flow minus Atlanta water supply withdrawal):
-
- (14) Trout Streams. Streams designated as Primary Trout Waters are waters supporting a self-sustaining population of Rainbow, Brown or Brook Trout. Streams designated as Secondary Trout Streams are those with no evidence of natural trout reproduction, but are capable of supporting trout throughout the year. Trout streams are classified in accordance with the designations and criteria as follows:
 - (a) Criteria.

Rev. July 1996

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FROM: RULES and REGULATIONS for WATER QUALITY CONTROL,
CHAPTER 391-3-6, REVISED 30 JULY 1996.

MINIMUM FLOW PROVISIONS

3 APPARENT CONDITIONS

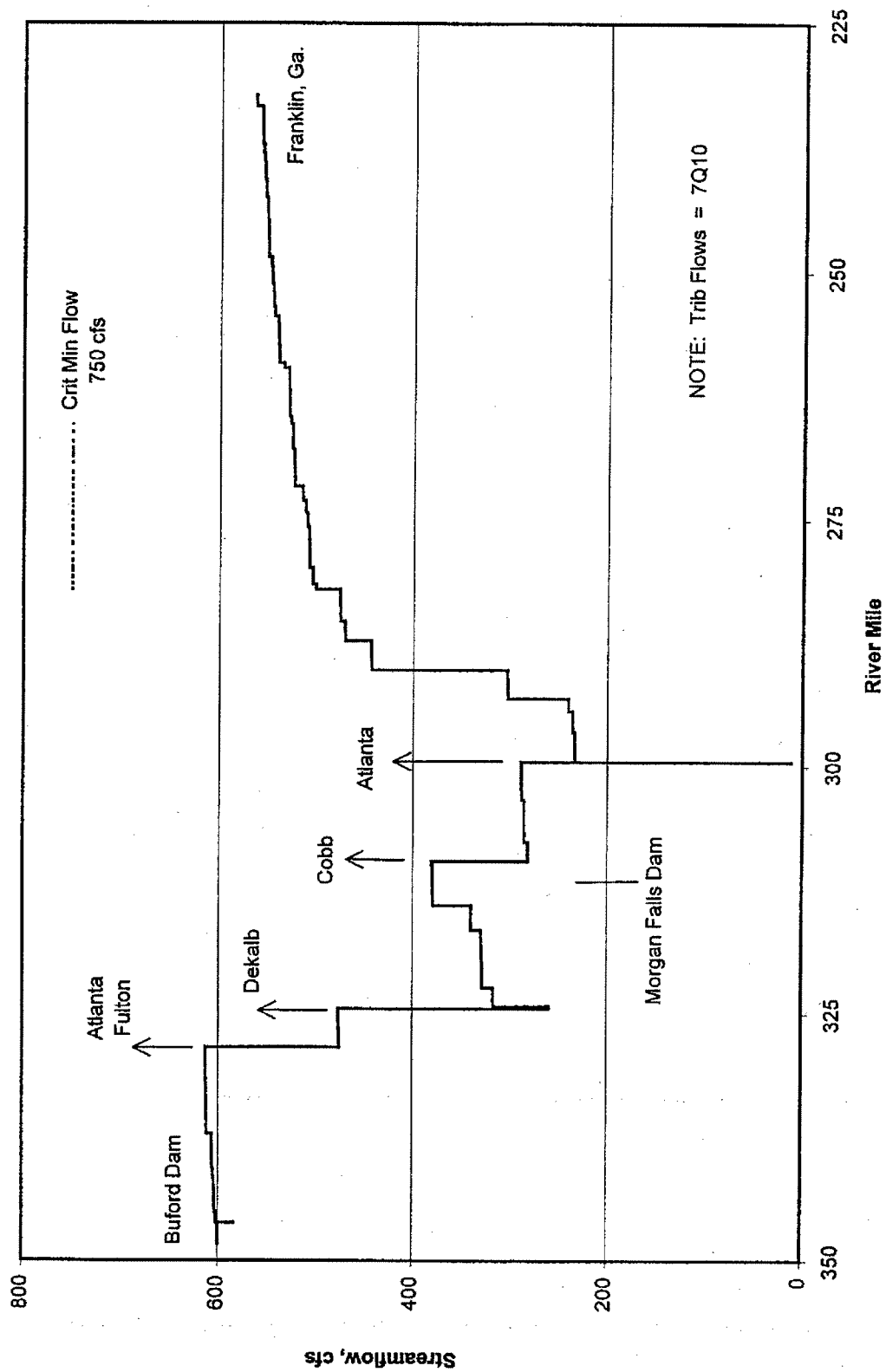
A. THE UNREGULATED PORTIONS

- TRIBUTARIES -- TQ10

B. THE REGULATED PORTIONS

- UPSTREAM OF PEACHTREE CREEK
→ "ALL FLOWS"
- DOWNSTREAM of PEACHTREE CREEK
→ "GREATER THAN 750 cfs
AT ALL TIMES"

Streamflow at Steady-State Critical Conditions



Chattahoochee River Modeling Project
Environmental Protection Division
Atlanta, Georgia

750 CFS MINIMUM FLOW REQUIREMENT

Historical Development

- o 1947 -- Buford Dam Authorization (House Document No. 300, 80th Congress) required that releases from Buford Dam maintain a minimum flow at Atlanta of 650 cfs. This number did not take into account any intakes and discharges in between. It was based on one small "service" unit operating at 600 cfs, plus 50 cfs of dry weather tributary inflow.
- o 1958 -- Buford Dam operational.
- o 1960 -- The City recognized that a 650 cfs minimum at Atlanta would not be adequate to meet water supply demands and the need for assimilation of treated wastes. Atlanta entered into a joint agreement with Georgia Power Company to fund expansion of storage capacity at Morgan Falls Dam. This included an increase in spillway height to provide for a minimum flow of at least 750 cfs "above the Atlanta intake" at all times.
- o 1965 -- City of Atlanta *Consultant's Report* indicated that, at currently attainable wastewater treatment levels, this minimum flow would cause a serious depletion of River dissolved oxygen by 1985.
- o 1966 -- the Georgia Water Control Board proposed a revision of water quality standards from Peachtree Creek to Cedar Creek. The proposal would revise the classification from "industrial" to "fishing"; this would increase the minimum DO from 3 mg/l to 5 mg/l.
- o 1972-1974 -- EPD performed intensive surveys from Peachtree Creek to Franklin, Georgia, to develop the steady-state DOSag model later used for the Atlant Metro wasteload allocation. West Point Lake was under construction at that time.
- o March 1972 -- The Senate Public Works Committee resolution, 92nd Congress, authorized the *Metropolitan Atlanta Water Resources Study (MAWRS)*. This effort, coordinated by the Savannah District Corps of Engineers, was intended to provide "a plan for the development, utilization, and conservation of water and related land resources for Atlanta, Georgia, and contiguous areas". Minimum flow requirements for wastewater assimilation at Atlanta were central to this Study. MAWRS also revised projections of future water supply withdrawals and wastewater treatment discharges for the study area.
- o October 1972 -- The *Federal Water Pollution Control Act of 1972*, Public Law 92-500, was enacted. The law required that all municipal facilities be upgraded to at least secondary treatment.

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- o 17 July 1974 -- At a public meeting on the "Lake Sidney Lanier Project Review", Leonard Ledbetter outlined the Environmental Protection Division's policies for the protection of water quality in the Chattahoochee River from Buford Dam to West Point Lake. He announced that **"the flow in the Chattahoochee River at the point between the existing City of Atlanta water intake and Peachtree Creek must not be less than 750 cfs at any time."**
- o August 1975 -- EPA Region IV approved the revision of water quality standards proposed in 1966.
- o Late 1970's -- EPD developed the Atlanta Metro wasteload allocation using the 750 cfs at Peachtree Creek as the critical "headwater flow" for the Dosag model developed several years earlier.
- o January 1992 -- *Memo of Understanding*, authorizing the Tri-State Comprehensive Study, signed by contending parties.
- o June 1992 -- The Division initiates the Chattahoochee River Modeling.

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MINIMUM FLOW PROVISION

Why, How, and Where?

o Why is it located at that unusual spot?

"Only because the original Dosag model started there and thus needed a constant headwater flow value to begin DO calculations."

o How was the "750 cfs" number developed?

Step 1: the historic record at Paces Ferry Road showed that an average flow of 915 cfs was equaled or exceeded 99 days out of 100.

Step 2: at that time, the maximum withdrawal at the Atlanta intake was assumed to be 164 cfs. (It's now 278.5 cfs.)

Step 3: the minimum flow below the Atlanta intake thus equals the minimum flow at Paces Ferry Road minus the maximum withdrawal at Atlanta; or, 915 minus 164 equals 751 cfs. This result was then rounded off to 750 cfs.

o Is that a good location?

No. There's nothing special about that point in the River for regulatory decisions. Moreover, it's difficult to implement Model scenarios with the minimum flow target wedged in between the Intake and Peachtree Creek.

o Where should minimum flows be specified?

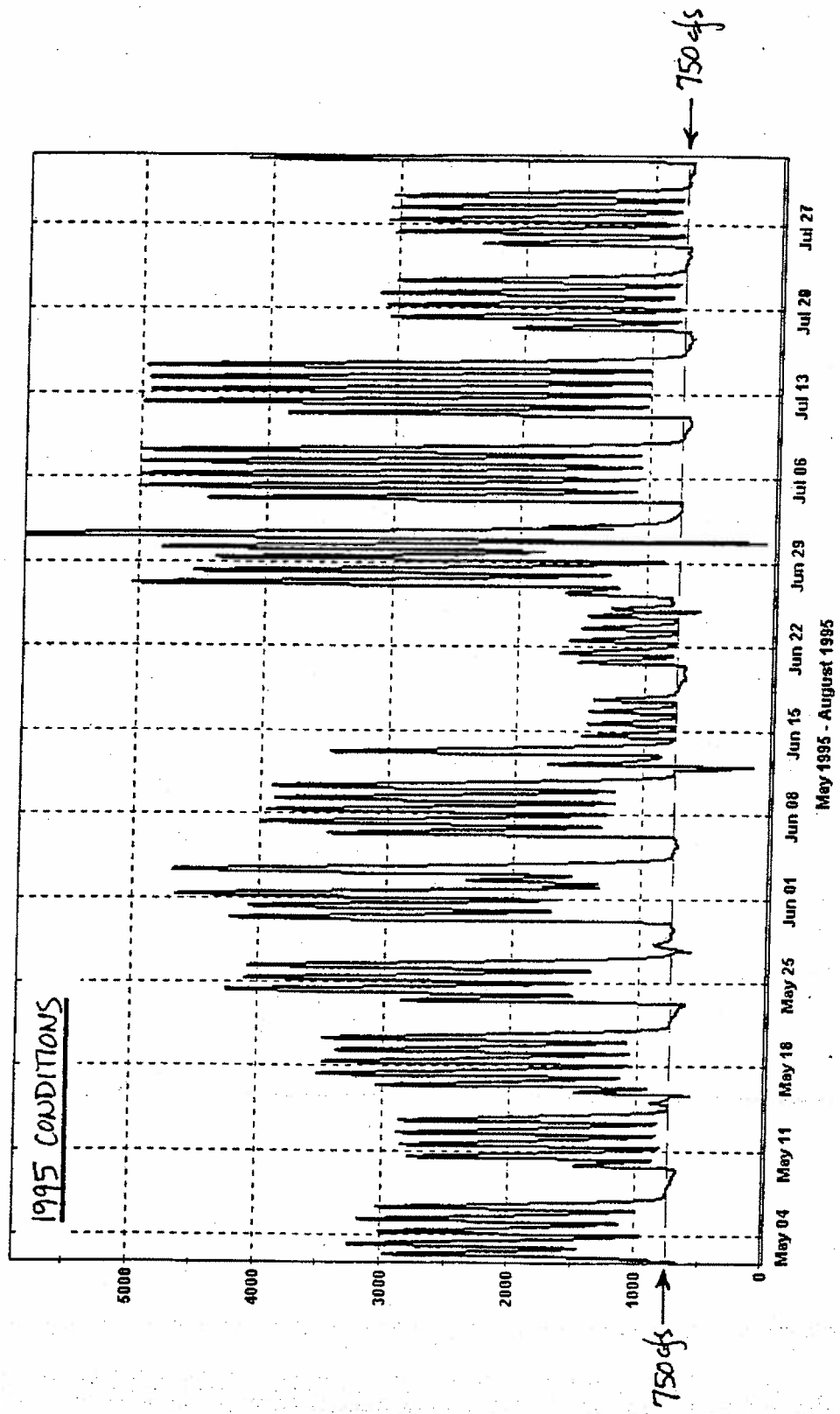
Two places. Buford Dam primarily; and, Morgan Falls Dam for its re-regulation capability.

MINIMUM FLOW PROVISION

Policy Choices and Problem Solving

- o There is nothing unique or special about the current location of the 750 cfs at Peachtree Creek. In fact, it should be relocated and the flow value changed to reflect the relocation.
- o The 750 cfs minimum flow provision did not come from any model. It derived from a "policy choice" to work with the amount of water currently available in the system.
- o Thus, the concept of "water available" can also be used today to evaluate issues and solve problems, including TMDLs.
- o If we accept this concept, then the next policy question becomes "should we make more water fundamentally available than currently exists?" This can only be accomplished by systematically releasing more water from Buford Dam.
- o If we want more water from Buford Dam then we must be clear about the question "for what purpose". That purpose can only be "to solve problems or satisfy needs downstream".
- o Accordingly, "do we have the right" to ask Buford Dam to put more water into the system to solve problems created by others downstream? (Given that Buford Dam takes care of its own problems, like low DO releases.) Or, put another way, should not those who create problems be expected to solve them.
- o What are the problems that can be solved downstream by releasing more water from Buford Dam? To answer that we need to distinguish between: (1) short-term operational releases; and, (2) long-term flow increases. Also, we need to look at the problems that were solved in 1974 compared to the problems that exist today.

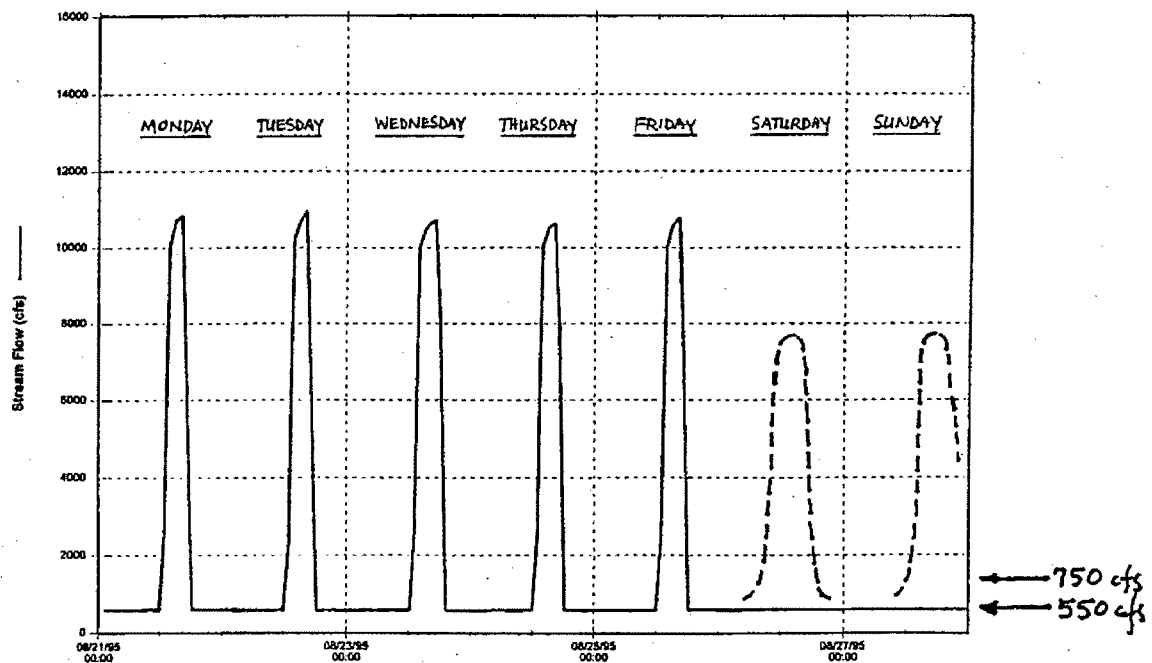
STREAMFLOW (cfs) ABOVE PEACHTREE CREEK W. "PIPES AT PERMIT"



MINIMUM FLOW PROVISION

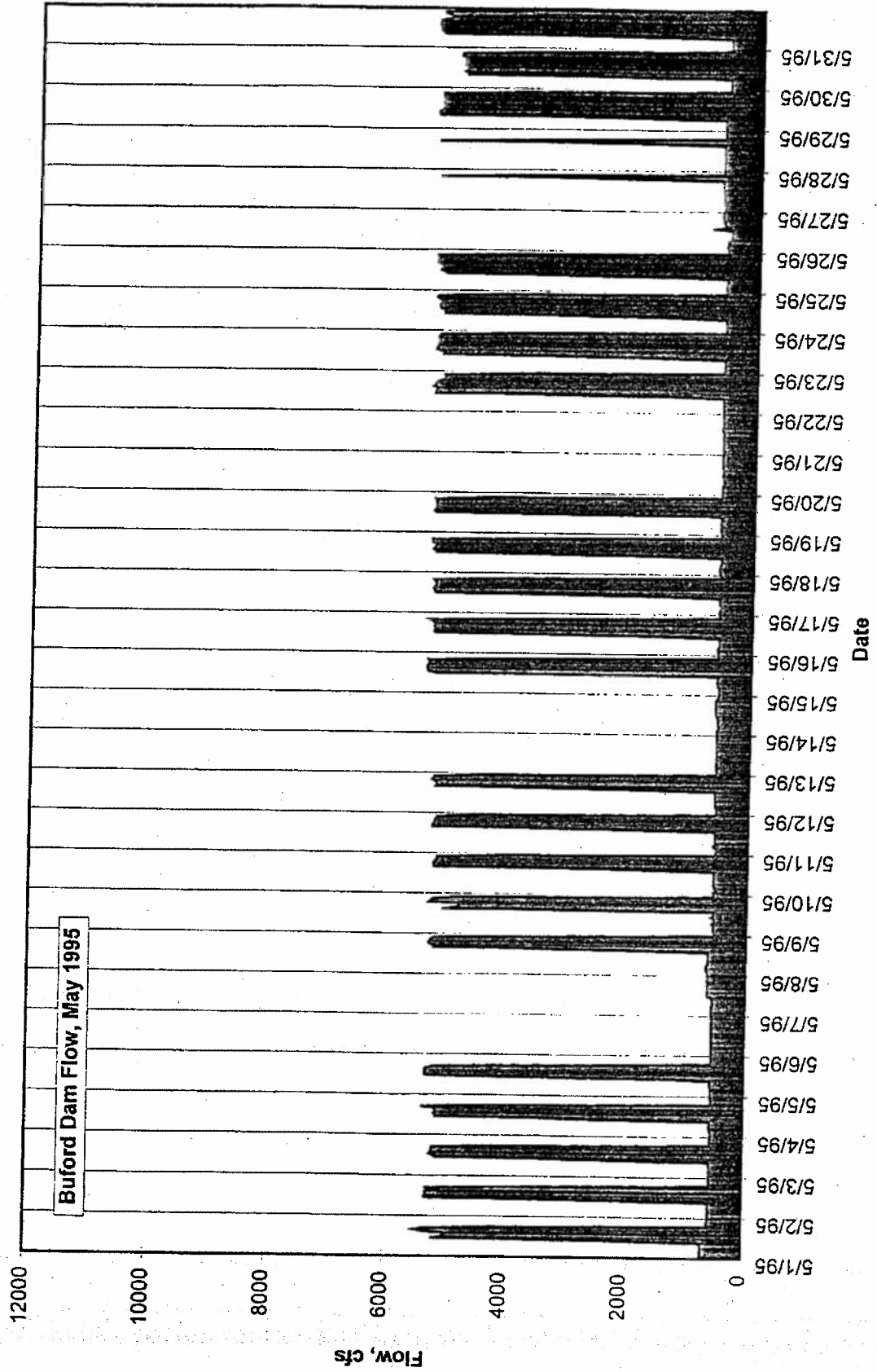
More Water From Buford Dam?

- o Short-term operational release: a real-time change in operation to solve an immediate problem. Example, the operator at Morgan Falls Dam calls Buford and asks for more water to meet minimum flow needs at Peachtree on the weekend.
- o Long-term flow increases: fundamental changes in operation.

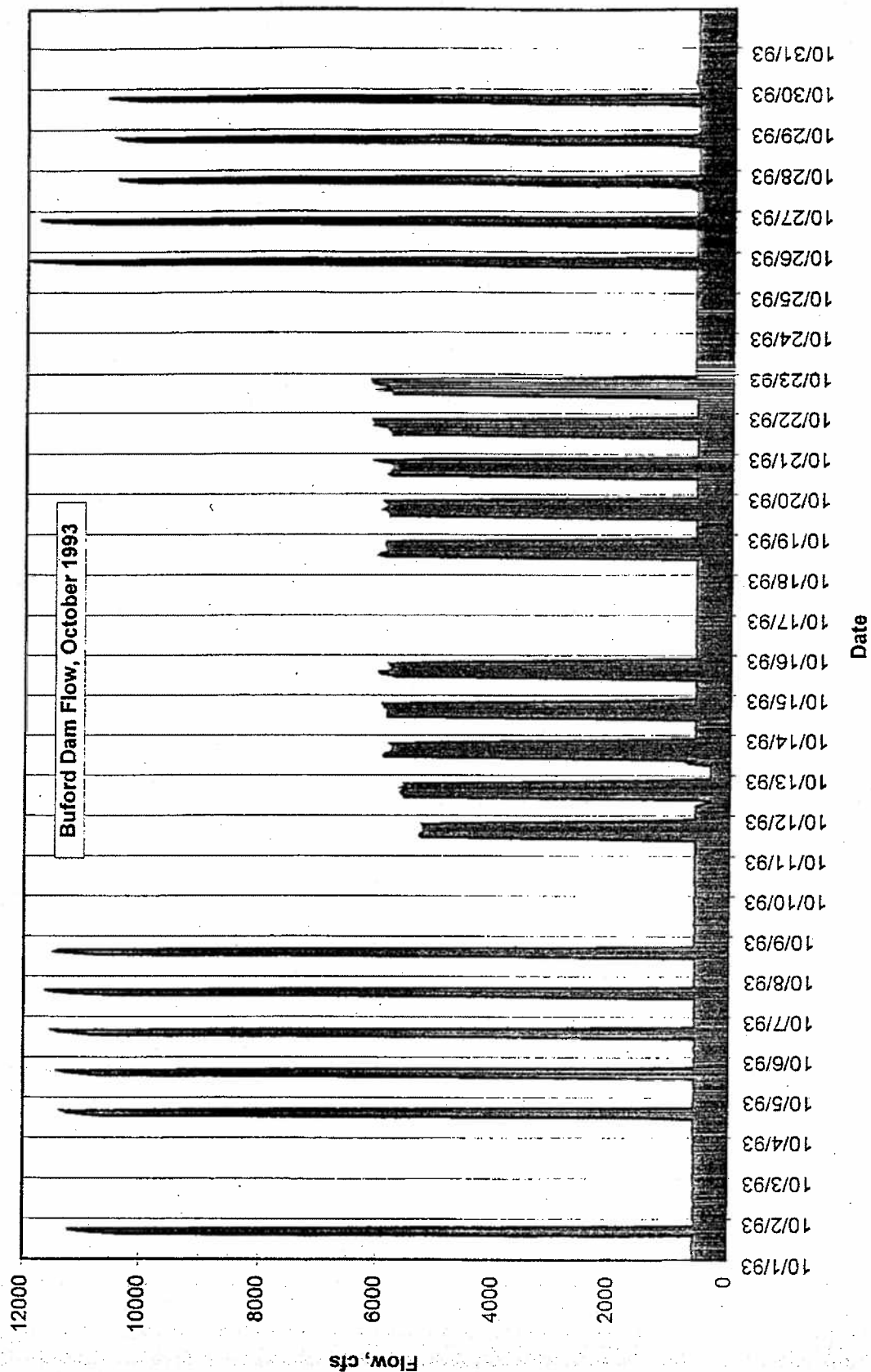


1. Always add more water on weekends.
2. Raise the minimum release from 550cfs to a higher value.
3. Revise the power generation pattern -- flow and duration.

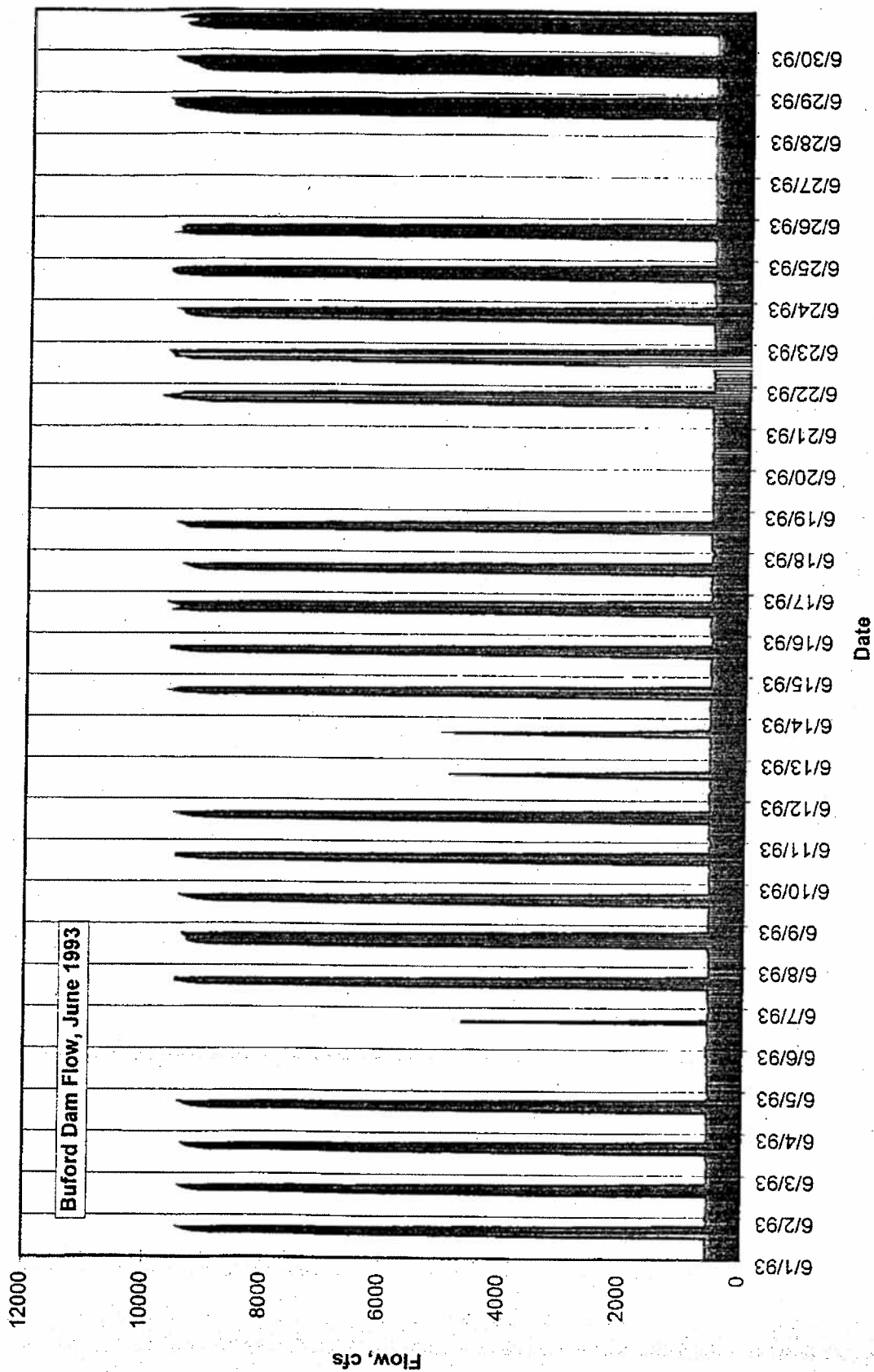
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